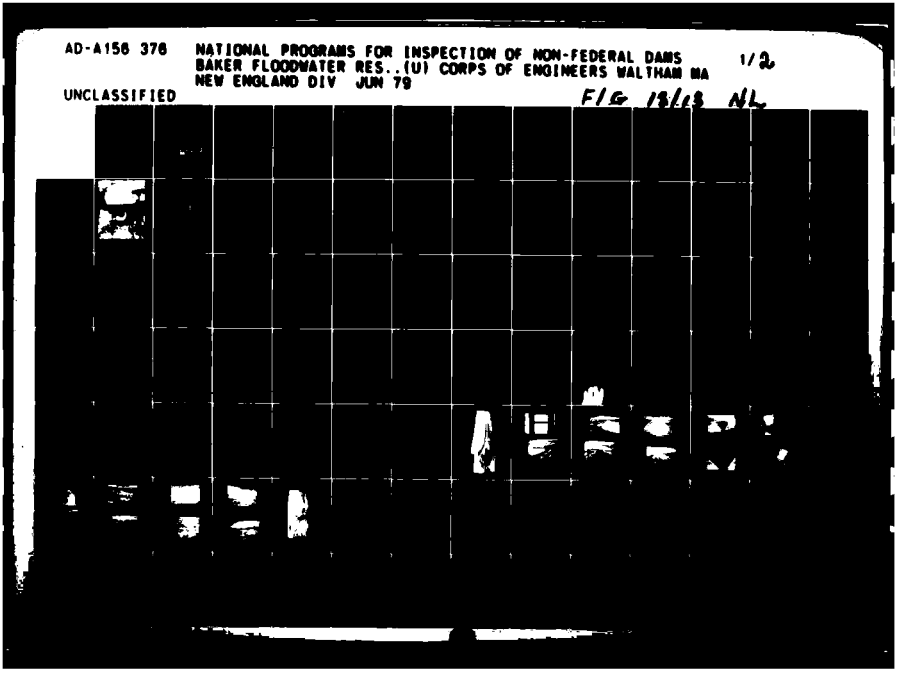
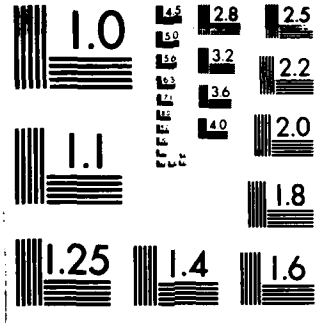
AD-A156 378 NATIONAL PROGRAMS FOR INSPECTION OF NON-FEDERAL DAMS BAKER FLOODWATER RES..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV JUN 79 1/2

UNCLASSIFIED F/G 13/13 NL





MERRIMACK RIVER BASIN

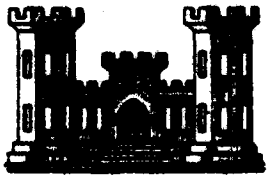
WARREN, NEW HAMPSHIRE

BAKER FLOODWATER RESERVOIR SITE 2

NH 00231

NHWRB NO. 244.10

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

JUNE 1979

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NH 00231	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Baker Floodwater Reservoir Site 2 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE June 1979 13. NUMBER OF PAGES 76
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Merrimack River Basin
Warren, New Hampshire
Gerry Brook

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The dam is a 805 ft. long, 68 ft. high earthen embankment structure with three different fill zones. The visual inspection endicated that the dam is in good condition. The inspection revealed minor deterioration of concrete on the riser structure and at the end of the 4 ft. diameter outlet pipe. It is intermediate in size with a high hazard potential. There are no recommendations for the dam based on the inspection report.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:

OCT 2 1979

NEDED

Honorable Hugh J. Gallen
Governor of the State of New Hampshire
State House
Concord, New Hampshire 03301

Dear Governor Gallen:

I am forwarding to you a copy of the Baker Floodwater Reservoir, Site-2 Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Water Resources Board, the cooperating agency for the State of New Hampshire. In addition, a copy of the report has also been furnished the owner, New Hampshire Water Resources Board, Concord, New Hampshire 03301.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Water Resources Board for your cooperation in carrying out this program.

Sincerely,

Max B. Scheider

Incl
As stated

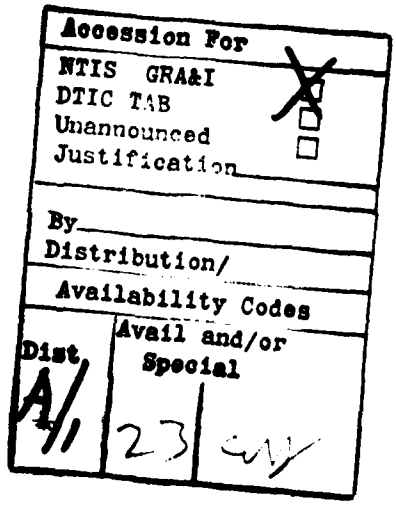
MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

BAKER FLOODWATER RESERVOIR SITE 2

NH 00231

NHWRB 244.10

MERRIMACK RIVER BASIN
WARREN, NEW HAMPSHIRE



PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

LETTER OF TRANSMITTAL

FROM THE CORPS OF ENGINEERS TO THE STATE

TO BE SUPPLIED BY THE CORPS OF ENGINEERS

NATIONAL DAM INSPECTION PROGRAM
PHASE I - INSPECTION REPORT
BRIEF ASSESSMENT

Identification No.: 00231

Name of Dam: Baker Floodwater Reservoir Site 2

Town: Warren

County and State: Grafton, New Hampshire

Stream: Berry Brook

Date of Inspection: May 17, 1979

Baker Floodwater Reservoir Site 2 is a 805 foot long, 68 foot high earthen embankment structure, with three different fill zones. Top width of the dam is 20 feet. The slope of upstream and downstream embankments is 2½ horizontal to 1 vertical. Appurtenant structures consist of a concrete riser principal spillway with a 4.0 foot diameter discharge pipe. The principal spillway has two stages, an orifice type low stage inlet and a covered top high stage inlet. The principal spillway discharges to an impact type stilling basin. A vegetative lined emergency spillway 95 feet wide is located on the left side of the dam. There is a 24 inch diameter gated pond drain pipe. The dam construction was completed in September of 1969. As built construction plans, design data and construction data were available, and were prepared by the Soil Conservation Service.

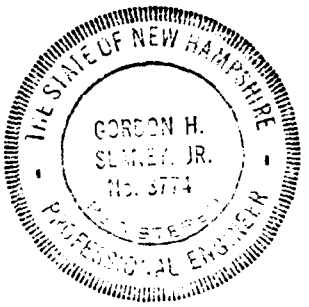
The visual inspection indicated that the dam is in good condition. The inspection revealed minor deterioration of concrete on the riser structure and at the end of the 4 foot diameter outlet pipe. Also noted during the inspection was minor seepage of clear water on the right abutment and a surface erosion gully at the juncture of the downstream slope and the left abutment.

Based on the intermediate size of the dam and its high hazard classification and in accordance with Corps of Engineers guidelines, the test flood inflow is the Probable Maximum Flood)PMF) equal to 14,100 cfs. The routed test flood outflow of 10,000 cfs overtops the dam by approximately 0.8 feet. With the water level at the top of dam, the spillways will pass 54 percent of the routed test flood outflow. As there is a high hazard to loss of life from large flows downstream of the dam, a review was made using ½ the PMF. The

analysis indicates that the ½ PMF inflow would be 7,050 cfs. The routed ½ PMF outflow would be 3,460 cfs. As the maximum capacity of the spillways is 6,706 cfs there will be a freeboard of 3.0 feet. The test flood inflow was routed with the water surface starting at the recreational pool level. Hydraulic design calculations indicate that the principal spillway was designed to retard flood flows up to a 100 year frequency. The crest of the dam was designed using a total watershed runoff of 10.84 inches.

There are no recommendations for this dam based on the Phase I Inspection Report. Remedial measures include the development of a downstream warning system, repair of the deteriorated concrete on the riser and at the end of the 4 foot diameter discharge pipe, and observation and recording of seepage at the right abutment.

The remedial measures are described in Section 7 and should be addressed within 2 years after receipt of this Phase I Inspection Report by the owner.



Gordon H. Slaney, Jr., P.E.
Project Engineer

Howard, Needles, Tammen & Bergendoff
Boston, Massachusetts

This Phase I Inspection Report on Baker Floodwater Reservoir Site 2 has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there by any chance that unsafe conditions be detected.

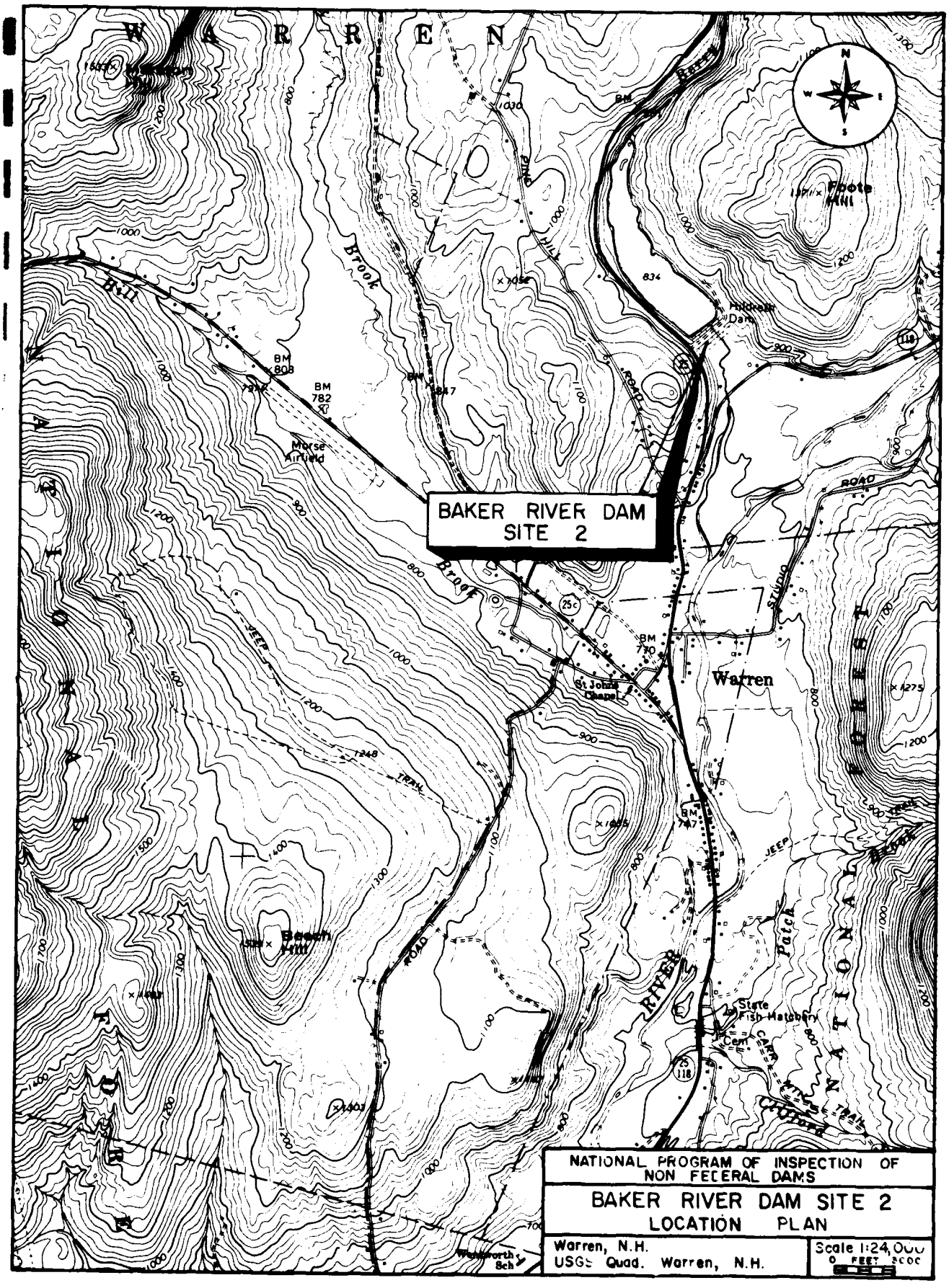
Phase I inspections are not intended to provide detailed hydrologic and hydraulic analses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrogogic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

TABLE OF CONTENTS

REPORT

APPENDIXES

BAKER RIVER DAM SITE 2 - Overview looking upstream



NATIONAL PROGRAM OF INSPECTION OF NON FEDERAL DAMS

BAKER RIVER DAM SITE 2
LOCATION PLAN

Warren, N.H.
USGS Quad. Warren, N.H.

Scale 1:24,000
0 FEET 2000

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
BAKER FLOODWATER RESERVOIR SITE 2

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Howard, Needles, Tammen & Bergendoff has been retained by the New England Division to inspect and report on selected dams in the State of New Hampshire Authorization and notice to proceed were issued to Howard, Needles, Tammen & Bergendoff under a letter of March 30, 1979 from John P. Chandler, Colonel, Corps of Engineers. Contract No. DACW33-79-C-0060 has been assigned by the Corps of Engineers for this work.

b. Purpose

(1) To perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) To encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location. Baker Floodwater Reservoir Site 2 (Baker Dam Site 2), also known as David Wayne Hildreth Dam, is located on Berry Brook approximately one mile upstream from the center of Warren, in the Town of Warren, New Hampshire. The dam is shown on U.S.G.S. Quadrangle Warren, New Hampshire, with approximate coordinates of N43°56'24", W71°53'24", Grafton County, New Hampshire. The location of Baker Dam Site 2 is shown on the preceding page.

b. Description of Dam and Appurtenances. Baker Dam Site 2 is an earthen embankment structure. Total length of the dam, according to existing drawings, is 805 feet. Maximum structural height is 84 feet, and the height from the top of dam to the streambed is 68 feet. According to the plans there are three different fill zones in the structure, which include a cutoff wall. Approximately 67 percent of the length of the cutoff wall extends to bedrock. Top width of the dam is 20 feet and the embankment is on a 2½ horizontal to 1 vertical slope both up and downstream.

Appurtenant structures consist of a concrete riser and pipe principal spillway with a covered top inlet. There are two stages to the inlet structure, a low stage orifice and a high stage covered inlet. The riser discharges through a 4.0 foot diameter concrete pipe and an impact type stilling basin. The emergency spillway is located on the left side of the dam and has a width of 95 feet. It is an excavated earthen structure with a vegetative cover. A 24 inch diameter pond drain pipe can be opened from the riser with a 24 inch diameter gate valve structure to lower the water level.

Figures 1 and 2, located in Appendix B, show a plan of the dam and appurtenant structures. Photographs of each structure are shown in Appendix C.

c. Size Classification. Intermediate (hydraulic height - 68 feet, storage - 2,400 acre-feet) classification based on height being between 40 and 100 feet and storage being between 1,000 acre-feet and 50,000 acre-feet as given in Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification. The potential for hazard posed by this dam is classified as high. Failure of the dam at maximum pool elevation (top of dam) would probably result in a total flood wave approximately 20 feet high through the center of Warren. About 20 dwellings would probably be inundated. Another 30 structures near the edge of the flooded area may be affected.

e. Ownership. This dam is owned by the New Hampshire Water Resources Board, 37 Pleasant Street, Concord, New Hampshire.

f. Operator. This dam is maintained and operated by the New Hampshire Water Resources Board. Chairman of the Water Resources Board is Mr. George McGee, Sr.; Mr. Vernon Knowlton is Chief Engineer, Telephone No. 603/271-1110.

g. Purpose of Dam. This dam is used for both floodwater control and recreation. The recreational pool is maintained by the low stage intake in the riser. The storage between the low stage outlet and the emergency spillway crest is used for floodwater control.

h. Design and Construction History. The construction of this dam was completed in September of 1969. Design and construction inspection of this dam were done by the Soil Conservation Service, Durham, New Hampshire. The construction contractor was Windham Roads, Windham, New Hampshire.

i. Normal Operating Procedures. The recreational pool is maintained by the low stage inlet on the riser. Under flood conditions, when the capacity of the low stage orifice is exceeded, the storage is utilized. The high stage outlet will reach maximum design discharge before the reservoir reaches the crest of the emergency spillway. The dam does not require any manual operation in order to function.

1.3 Pertinent Data

a. Drainage Area. The area tributary to Baker Dam Site 2 consists of 6.64 square miles of mountainous terrain. The entire watershed is located in the White Mountain National Forest, with little development. Maximum elevation is at about 3500 feet MSL, and reservoir full elevation is at 860 feet.

The area around the reservoir is mostly wooded with some open meadows. There are no cottages or dwellings along the shoreline. Route 25 runs along the right bank of the reservoir.

b. Discharge of Dam Site

(1) Outlet works for Baker Dam Site 2 consist of an emergency spillway, a riser with a low stage orifice and a high stage covered top spillway, and a 24 inch pond drain pipe controlled by a gate. Invert of the pond drain is at 807.5 feet. Maximum discharge of the pipe when the reservoir is at the recreational pool level of 834.0 feet is about 87 cfs. The low stage orifice has one opening 36 inch by 23 inches in size set at invert 834.0. Capacity of the low stage inlet when the reservoir is at the crest of the high stage inlet (852.0 ft) is 64 cfs. The high stage covered inlet crest set at elevation 852.0 feet has a capacity of 439 cfs when the water level is at the emergency spillway crest of 861.5 feet. The 95 foot wide emergency spillway has a crest at elevation 861.5 feet. When the water surface is at the top of dam (elevation 870.0) the spillway will have a capacity of 670.6 cfs.

(2) There are no records available of maximum discharge at the site. However, during the inspection of the dam on May 17, 1979 it was noted that debris on the face of the dam reached to about elevation 846.0 which would correspond to a discharge of about 100 cfs.

(3) The spillway and riser capacity with the water surface at the top of the dam is approximately 7200 cfs at elevation 870.0.

(4) Spillway and riser capacity with the water surface elevation at the test flood elevation of 870.8 feet is approximately 8220 cfs.

(5) The total project discharge at the test flood elevation of 870.8 feet is 10,000 cfs.

c. Elevation (feet above MSL)

(1) Streambed at centerline of dam - 802.0

(2) Maximum tailwater - unknown

(3) Upstream portal invert pond drain - 807.5

(4) Recreation pool - 834.0

(5) Full flood control pool - 859.6

(6) Spillway crest (emergency spillway) - 861.5
(riser crest) - 852.0

(7) Design surcharge - 859.6

(8) Top Dam - 870.0

(9) Test Flood Surcharge - 870.8

d. Reservoir (miles)

(1) Length of Maximum Pool - .87

(2) Length of Recreational Pool - .61

(3) Length of Flood Control Pool - .84

e. Storage (gross acre-feet)

(1) Recreation Pool - 500

(2) Flood Control Pool - 1770

(3) Emergency Spillway Crest Pool - 1880

(4) Top of Dam - 2400

f. Reservoir Surface (acres)

(1) Recreation Pool - 37.5

(2) Flood Control Pool - 60.0

(3) Emergency Spillway Crest - 61.0

(4) Test Flood Pool - 68.0

(5) Top Dam - 68.0

g. Dam

(1) Type - earth

(2) Length - 805 feet

(3) Height - 68 feet hydraulic
84 feet structural

(4) Top Width - 20 feet

(5) Side Slopes - 2½ horizontal to 1 vertical up and downstream

(6) Zoning - 3 zones of fill

(7) Impervious core - none

(8) Cutoff - zone 1 fill

(9) Grout Curtain - none

(10) Other - none

h. Diversion and Regulating Tunnel

See Section j below.

i. Principal Spillway

(1) Type - concrete riser, covered top - 4 foot diameter discharge pipe through dam.

(2) Length of Weir - 24 feet total

(3) Crest Elevation - 852.0

(4) Gates - none

(5) U/S Channel - none

Emergency Spillway

(1) Type-earth, overflow

(2) Length of Weir - 95 feet

(3) Crest Elevation - 861.5

(4) Gates - none

(5) U/S Channel - Approach channel from reservoir is 95 feet wide with 2½:1 sides.

(6) Downstream Channel - The downstream channel is about 15 feet wide. The left bank is relatively flat pasture land. There is a farm house located immediately downstream of the dam. Along the right bank there are scrub trees growing with some of them growing in the channel.

j. Regulating Outlets. The recreation level of the reservoir is controlled by one 36 inch by 23 inch orifice inlets set in the riser at invert elevation 834.0. There is a trash rack for the opening but no control gate. The 24 inch pond drain pipe set at invert 807.5 extends 64 feet into the reservoir from the riser, and has a trash rack at the intake. The pipe is controlled at the riser by a gate.

SECTION 2
ENGINEERING DATA

2.1 Design

A complete set of design data including layout, hydraulic design, foundation and embankment design, geology and soils reports, structural design, quanities and specifications are available for Baker Dam Site 2. In addition, there are construction drawings available. Design of the dam was done by the Soil Conservation Service, Durham, New Hampshire.

2.2 Construction

The dam construction was completed in September of 1969. A complete record of construction documents were made available. These documents include; as-built plans, job diarys, surveying records, test drilling logs, compaction test results, concrete tests and certificate of completion. Construction was by Windham Roads, Windham, New Hampshire and was inspected by the Soil Conservation Service, Durham, New Hampshire.

2.3 Operation

Normally, the pond drain line gate is closed. The recreational level of 834.0 is maintained by the low stage orifice openings. The principal spillway riser and reservoir storage is designed to retard runoff from up to a 100 year frequency storm without discharge occurring in the emergency spillway (crest 861.5).

2.4 Evaluation

a. Availability. Engineering data available for Baker Dam Site 2 consists of the information outlined in Sections 2.1 and 2.2. The plans, design data, and construction records are available at the offices of the Soil Conservation Service, Federal Building, Durham, New Hampshire, 03824.

b. Adequacy. A complete set of design and construction data did allow for a definative review within the confines of this Phase I - Inspection Report. Therefore, the adequacy of this dam is based on the design and construction data reviewed, visual inspection, past performance history and sound engineering judgement.

c. Validity. The field investigation indicated that the external features of Baker Dam Site 2 substantially agree with those shown on the available plans.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General. The field inspection of Baker Dam Site 2 was made on May 17, 1979. The inspection team consisted of personnel from Howard, Needles, Tammen & Bergendoff and Geotechnical Engineers, Inc. A representative of the New Hampshire Water Resource Board was also present during the inspection. Inspection checklists, completed during the visual inspection, are included in Appendix A. At the time of inspection the water level was approximately 0.5 feet above the low stage inlet. The upstream face of the dam could only be inspected above this water level.

b. Dam. Visual inspection of the dam indicated that it is in good condition.

The dam consists of an earth embankment about 805 feet long and 68 feet high. The embankment is zoned and has a central core, which is integral with a cut-off trench extending to bedrock. There is a trench drain and blanket drain beneath the downstream section of the embankment.

An unpaved emergency spillway has been cut into the left abutment, and a principal spillway consisting of a drop inlet structure, concrete conduit and outlet structure is located on the approximate center of the embankment.

Upstream Slope

The upstream face was constructed on a slope of 2.5 horizontal to 1 vertical and has a 10 foot wide berm at elevation 834.5, which is 35 feet below the crest. The permanent pool is defined as elevation 834.0 feet, and at the time of inspection the pool was approximately at this elevation.

The upstream slope has a good grass cover, as shown in Photo No. 3. Minor erosion and surface slumping has occurred in the past on the upstream slope near the right abutment contact area which is now well-covered with grass. This area is shown in Photo No. 18.

Crest

The crest of the dam is 20 feet wide and has a sand and gravel roadway, in good condition. Photo No. 5 shows the crest. No significant misalignment of the crest was observed.

Downstream Slope

The downstream slope is 2.5 horizontal to 1 vertical. The slope shown in Photos No. 6 & 7 is grass covered and generally in good condition. There is an erosion gully at the contact of the slope and the right abutment which is shown in Photo No. 19. The gully has been filled with small boulders at several points along its length, presumably to impede the flow of water. At this time this erosion feature poses no safety problem, but this feature should be examined during future inspections to establish if it is increasing in size.

There is a wet area at the toe of the slope which appears to be due to runoff from a spring on the right abutment about 10 feet from the toe of the embankment at about El 832. The area of this spring is shown in Photo No. 17. The pool elevation at the time of inspection was about 834.5. Since the dam is about 160 feet wide at El 834, it does not seem likely that the spring is a result of seepage through the embankment. This spring and the wet area at the toe of the slope should be closely observed at various reservoir elevations to establish if flow from the spring is related to the reservoir elevation.

Photo No. 15 shows the vegetation that has started to grow along the surface drainage path from the spring to the outlet channel.

At the time of inspection, the water level in the outlet stilling basin was above the outlet pipes of the downstream drainage system, and it could not be determined if water was exiting from these outlets.

c. Appurtenant Structures. Visual inspection of the concrete riser (principal spillway) structure, emergency earth spillway outlet works structure did not reveal any evidence of stability problems. The riser structure generally appeared to be in good condition, except for rust staining, heavy scaling and loss of surface mortar in some locations on the shaft walls.

The spillway trash racks and service ladder are in good condition. Rust was noted only at the manhole cover plate.

The concrete riser (principal spillway) structure consists of three elements; an overflow control with low stage inlet and high stage, covered top crest spillway, a vertical transition and a closed discharge conduit with an impact type stilling basin. The riser structure is placed in the embankment. Visual inspection revealed that the riser structure appeared to be in good condition, except for rust staining, extensive surface scaling, cracks and loss of surface mortar in some locations. Loss of coarse aggragate particales were noted, Photos No. 8,9,10,11 & 12.

The trash racks at the low and high stage intakes of the principal spillway consist of standard shape angles and grating. Both trash rack assemblies are in good condition. No rust or peeling of the protective coating were noted.

The emergency earth spillway is a large relatively flat grassy area located at the left abutment.

The upstream channel, viewed from the axis, is shown in Photo No. 21 and the downstream channel from the dam is shown in Photo No. 20. Photo No. 16 shows a wet area at the toe of the cut slope forming the right wall of the spillway. This area is about 100 feet downstream from the dam axis.

The pond drain pipe, intake structure and gate could not be inspected as it was under water. The operating mechanism appeared to be in good condition.

The outlet works structure at the toe of the dam consisting of 48 inch reinforced concrete pipe and stilling basin structure is located at the original stream channel, Photos No. 13 & 14. The apron slab and training walls of the stilling basin structure appear to be in sound condition. Some water staining and concrete spalling were noted at the discharge pipe area.

Visual inspection of discharge, Photo No. 22 channel showed it to be in good condition. There appeared to be minimum obstructions to free flow.

d. Reservoir Area. The area around the reservoir is mostly wooded with some open meadows. There are no cottages or dwellings along the shoreline. Route 25 runs along the right bank of the reservoir. Debris was noted on the upstream face of the dam to 10 to 12 feet above the water surface at the time of inspection.

e. Downstream Channel. The downstream channel is about 15 feet wide. The left bank is relatively flat pasture land. There is a farm house located immediately downstream of the dam, Photo No. 22. Along the right bank there are scrub trees growing, with some of them growing in the channel. A beaver dam across the stream diverts flow from the channel to the farm land.

3.2 Evaluation

Visual examination indicates the dam is in good condition. The inspection of the dam revealed the following:

(a) Some staining, scaling and cracking of the concrete surface of the riser.

(b) Some water staining and concrete spalling around the 4 foot diameter outlet pipe.

(c) A minor spring of clear water on the right abutment.

(d) Minor surface erosion gully at the juncture of the downstream slope and the right abutment.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedure

Baker Dam Site 2 is used for floodwater control and recreation. Under normal operating procedures the dam is left to function as designed. The recreation pool level is maintained by the low stage orifice openings in the riser. Flood events of up to a 100 year frequency are retarded by the reservoir storage between the recreation pool and the emergency spillway crest. The emergency spillway is utilized only with events greater than a 100 year frequency.

4.2 Maintenance of Dam

The dam is inspected on an annual basis by the New Hampshire Water Resources Board and the Soil Conservation Service. Maintenance is undertaken as a result of the inspection on an as needed basis. The dam is visited on a monthly basis by personnel of the Water Resources Board.

4.3 Maintenance of Operating Facilities

Maintenance of the outlet works is performed as in Section 4.2.

4.4 Description of Warning Systems

There are no warning systems in effect for this facility.

4.5 Evaluation

The current operation and maintenance procedures for this facility appear to be adequate to insure that any problems encountered can be remedied within a reasonable period of time. However, the owner should establish a downstream warning system to follow in the event of emergency conditions.

SECTION 5
HYDROLOGY AND HYDRAULIC ANALYSIS

5.1 Evaluation of Features

a. General. Baker Dam Site 2 is an earthen embankment dam 805 feet long with a hydraulic height of 68 feet. The dam is constructed with three fill zones and an earth fill core which extends to bedrock over a portion of the length of the dam. Appurtenant works consist of a two stage riser and 4 foot diameter concrete pipe which discharges to an impact type stilling basin, an emergency spillway 95 feet wide and a 24 inch diameter gated pond drain.

The dam is used for floodwater control and recreation. The dam is classified as intermediate in size having a height of 68 feet and maximum storage of 2,400 acre-feet.

b. Design Data. According to the Soil Conservation Service design data, this dam is constructed to retard flood flows of up to a 100 year frequency storm without utilizing the emergency spillway. The design flood control elevation is 859.6 feet or 1.9 feet below the emergency spillway crest. Total runoff for this condition is 3.91 inches, during a six hour Type IIB storm. The crest of the dam was designed using a total watershed runoff of 10.84 inches. The structure is classified as having a "C" hazard which is defined as "dams located where failure may cause loss of life, serious damage to homes, industrial and commercial buildings, important public utilities, main highways, or railroads.

c. Experience Data. There are no records available of maximum discharge at the dam site. However, during the inspection of the dam on May 17, 1979, it was noted that debris on the face of the dam reached to about elevation 846.0 which would correspond to a discharge of about 100 cfs.

d. Visual Observations. No evidence of damage to any portion of the project from overtopping was visible at the time of inspection.

e. Test Flood Analysis. Even though detailed design and operational data are available for this dam, a hydrologic evaluation was performed using a test flood equal to the Probable Maximum Flood (PMF) as determined from Guide Curves issued by the Corps of Engineers. Based on a drainage area of 6.64 square miles, it was estimated that the test flood inflow at Baker Dam Site 2 would be 14,100 cfs. Following the guidance for Estimating Effect of Surcharge Storage on Maximum Probable Discharge results in a routed test flood

outflow of 10,000 cfs. As the maximum capacity of the spillways at the top of dam is 6,706 cfs (approximately 67 percent of the routed test flood outflow), the test flood will result in the dam being overtopped by approximately 0.8 feet.

As there is a high hazard to loss of life from large flows downstream of the dam (resulting from dam failure), and dam failure resulting from overtopping would significantly increase the hazard to loss of life downstream from the dam. A review using ½ the PMF was made. This analysis indicates that the test flood inflow would be approximately 7,050 cfs. Following the guidance for Estimating Effect of Surcharge Storage on Maximum Probable Discharge results in a routed ½ PMF outflow of 3,460 cfs. As the total capacity of the spillways at the top of dam is 6,706 cfs, the spillway can safely pass the routed ½ PMF outflow with a freeboard of approximately 3.0 feet.

f. Dam Failure Analysis. The impact of failure of the dam at maximum pool (top of dam) was assessed using the "Rule of Thumb" Guidance for Estimating Downstream Hazard Hydrographs issued by the Corps of Engineers. The analysis covered the reach extending from the dam to a point 3.3 miles downstream on the Baker River. Prior to breach of dam, the downstream river stage would be about 7.5 feet with the spillway at full capacity. Failure of the dam with the water surface at the top of dam would probably result in a flood wave stage of approximately 20 feet in the center of Warren. This flood stage would be reduced to about 16 feet in height at the Route 25 crossing of the Baker River 3.3 miles downstream of the dam. The main portion of the flood wave would probably inundate about 20 dwellings in the reach studied. In addition, there are another 30 dwellings in fringe areas that may experience flooding by the flood wave.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observation. The visual examination did not disclose an immediate stability problem.

b. Design and Construction Data. Design drawings and construction specifications Baker Dam Site 2 indicate the dam is a zoned embankment consisting of a central impervious core with a cut-off trench extending to bedrock.

The upstream slope is 2.5 horizontal and 1 vertical with a 10 foot wide berm at about mid-height.

The downstream slope is 2.5 horizontal to 1 vertical and has no berm.

There is a foundation drainage trench and blanket drain beneath the downstream portion of the embankment.

An emergency, grass-covered spillway passes around the embankment on the left abutment.

Construction records indicate that the dam and appurtenant structures were built according to the plans and specifications.

c. Operating Records. No operating records are available.

d. Post-Construction Changes. There is no record of post-construction changes.

e. Seismic Stability. This dam is located in Seismic Zone 2 and in accordance with recommended Phase 1 guidelines does not warrant seismic analysis.

SECTION 7
ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. The visual inspection of Baker Dam Site 2 indicates the dam is in good condition. The inspection revealed the following:

(1) Some staining, scaling, and cracking of the concrete surface of the riser.

(2) Some water staining and concrete spalling around the 4 foot diameter outlet pipe.

(3) A minor spring of clear water on the right abutment.

(4) Minor surface erosion gully at the juncture of the downstream slope and the right abutment.

The hydraulic analysis indicates that the spillway cannot pass the routed test flood without overtopping the dam.

b. Adequacy of Information. A complete set of design and construction data did allow for a definitive review with the confines of this Phase I - Inspection Report. Therefore, the adequacy of this dam is based on the design and construction data reviewed, visual inspection, past performance history and sound engineering judgement.

c. Urgency. This dam is in generally good condition. The recommendations and remedial measures described in Sections 7.2 and 7.3 should be accomplished within 2 years after receipt of this Phase I Inspection Report by the owner.

d. Necessity of Additional Investigation. No additional investigation is needed to complete the Phase I inspection.

7.2 Recommendations

There are no recommendations resulting from the Phase I inspection.

7.3 Remedial Measures

(a) Repair the concrete surface of the riser structure.

(b) Repair the concrete spalling at the end of the 4 foot diameter discharge pipe.

(c) Observe and record the condition of the spring on the right abutment with changing reservoir level. It is particularly important that these observations be made during the next filling of the reservoir.

(d) The brush and small trees that have started to grow just downstream of the dam toe should be cleared to the edge of the woods to permit observation of potential seepage in this area.

(e) The erosion gully at the right abutment contact should be observed to determine if this condition has stabilized. If continued erosion is noted, this gully should be paved.

(f) Devise a warning system to follow in the event of emergency conditions.

(g) Continue the periodic inspection on a biennial basis.

(h) Establish a system such that the reservoir level can be monitored during periods of intense rainfall.

7.4 Alternatives

There are no practical alternatives to the remedial measures outlined in Section 7.3.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT SITE 2, BAKER DAM

DATE May 17, 1979

TIME 9:15 AM

WEATHER Fair

W.S. ELEV. 834.8 U.S. - DN.S

PARTY:

1.	G. Slaney	HNTB	6.		
2.	S. Mazur	HNTB	7.		
3.	D. LaGatta	GEI	8.		
4.	C. Osgood	GEI	9.		
5.			10.		

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam	D. LaGatta , C. Osgood	
2.	Spillway, Outlet Works	S. Mazur	
3.	and Downstream Channel	G. Slaney	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PERIODIC INSPECTION CHECK LIST

A-2

PROJECT BAKER RIVER WATERSHED DAM #2 DATE May 17, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	870.0
Current Pool Elevation	834.8
Maximum Impoundment to Date	846.0 estimated from debris level.
Surface Cracks	None observed
Pavement Condition	Gravel road on crest
Movement or Settlement of Crest	None apparent
Lateral Movement	None apparent
Vertical Alignment	No misalignment noticeable
Horizontal Alignment	No misalignment noticeable
Condition at Abutment and at Concrete Structures	Good except for wet patch at downstream right abutment
Indications of Movement of Structural Items on Slopes	No structural items on slopes
Trespassing on Slopes	No damage from treaspass
Sloughing or Erosion of Slopes or Abutments	Minor erosion gully on upstream slope now well grassed over
Rock Slope Protection - Riprap Failures	Riprap only at outlet works; becoming covered with vegetation
Unusual Movement or Cracking at or near Toes	None observed
Unusual Embankment or Downstream Seepage	Some water on right abutment slope appears to originate at about El. 832 ft.
Piping or Boils	None observed
Foundation Drainage Features	Exits of drains are clear and open
Toe Drains	None exist
Instrumentation System	None exist
Vegetation	Good grass cover

PERIODIC INSPECTION CHECK LIST A-3

PROJECT SITE 2, BAKER DAM DATE May 17, 1979

PROJECT FEATURE Intake Channel/Structure NAME D. LaGatta, C. Osgood

DISCIPLINE Geotechnical, Structural, Engineers NAME S. Mazur

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	None observed
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	None
Debris	Some debris at low trash rack. (Riser structure)
Condition of Concrete Lining	
Drains or Weep Holes	—
b. Intake Structure	Concrete of riser structure at spillway intake openings is in good condition. Bottom water release structure was under water.
Condition of Concrete	
Stop Logs and Slots	

PERIODIC INSPECTION CHECK LIST A-4

PROJECT SITE 2, BAKER DAM DATE May 17, 1979

PROJECT FEATURE Control Tower NAME G. Slaney

DISCIPLINE Structural/Hydraulic Engineers NAME S. Mazur

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural General Condition Condition of Joints Spalling Visible Reinforcing Rusting or Staining of Concrete Any Seepage or Efflorescence Joint Alignment Unusual Seepage or Leaks in Gate Chamber Cracks Rusting or Corrosion of Steel	Outlet works (bottom water release structure) consist of inlet structure with trash rack and 24" ID reinforced concrete pipe extended to riser structure. Outlet works structure is controlled by mechanically operated gate.
b. Mechanical and Electrical Air Vents Float Wells Crane Hoist Elevator Hydraulic System Service Gates Emergency Gates Lightning Protection System Emergency Power System Wiring and Lighting System	Mechanically operated gate and control mechanisms are housed in riser structure. Gate is operated from roof of riser structure. Gate and control mechanisms appear to be in good operational condition.

PERIODIC INSPECTION CHECK LIST

A-5

PROJECT SITE 2, BAKER DAM

DATE May 17, 1979

PROJECT FEATURE Spillway/Outlet Works Conduit

NAME G. Slaney

DISCIPLINE Structural/Hydraulic Engineers

NAME S. Mazur

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	At the time of inspection outlet conduits were under water. Outlet conduit (dam section) consists of 48" ID reinforced concrete pipe and is placed on concrete bedding. Outlet works conduit appears to be in good condition.
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 2, BAKER DAM — DATE May 17, 1979

PROJECT FEATURE Outlet Structure/Channel — NAME D. LaGatta, C. Osgood

DISCIPLINE Structural/Hydraulic/Geotechnical — NAME S. Mazur, G. Slaney

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Concrete outlet works pipe and discharge channel including training walls are in good condition.
Rust or Staining	Water staining
Spalling	Some loss of concrete at concrete wall around discharge pipe.
Erosion or Cavitation	None
Visible Reinforcing	None
Any Seepage or Efflorescence	None
Condition at Joints	Good
Drain Holes	Water of channel above invert of drains so flow not apparent
Channel	Rock floored stream
Loose Rock or Trees Overhanging Channel	None
Condition of Discharge Channel	Clear except for brush encroaching on channel about 175 ft downstream

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 2, BAKER DAM DATE

PROJECT FEATURE NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	
General Condition	Good condition, gravel road crosses approach
Loose Rock Overhanding Channel	None
Trees Overhanging Channel	None
Floor of Approach Channel	Grass covered
b. Weir and Training Walls	This facility has two spillway structures; principal concrete riser or shaft spillway and emergency earth spillway located in left abutment. Both spillways generally are in good condition.
General Condition of Concrete	Some scaling - loss of surface mortar and in some locations loss of coarse aggregate particles. (Photo No. 12)
Rust or Staining Some rust staining	
Spalling	
Any Visible Reinforcing None	
Any Seepage or Efflorescence None	
Drain Holes	
c. Discharge Channel	
General Channel	Generally good, some wet areas
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	None
Floor of Channel	Wet area at base of cut slope, covered with vegetation
Other Obstructions	None

PERIODIC INSPECTION CHECK LIST A-8

PROJECT SITE 2, BAKER DAM DATE May 17, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	This facility has no service bridge.
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Under Side of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX B

ENGINEERING DATA

1. LIST OF DESIGN, CONSTRUCTION AND MAINTENANCE RECORDS
2. PAST INSPECTION REPORTS
3. PLAN AND DETAILS

AVAILABLE ENGINEERING DATA

1. A set of drawings (24 sheets), dated November 1965, showing plans and details of the dam and appurtenant structures.

2. Design Data: including layout, hydraulic design, geology and soils reports, structural design, quanities and specifications.

3. Construction Data: including as-built plans, job diarys, surveying records, test drilling logs, compaction test results, concrete tests, and certificate of completion.

All of the above are on file with the U.S.D.A. Soil Conservation Service, Federal Building, Durham, N.H. 03824.

PAST INSPECTION REPORTS

MAINTENANCE CHECKLIST FOR PL 566 FLOOD CONTROL STRUCTURES

This maintenance checklist is a guide for determining the maintenance required for Public Law 566 flood control structures in New Hampshire. It doesn't take the place of experience and judgment and is not inclusive. Items of a difficult nature to check, such as principal spillway conduit condition, are not included. Intensive checks of these items are necessary at proper intervals. Review of As Built drawings, the design folder, structure history, and previous maintenance reports should be part of the inspection. Prompt maintenance is a vital part of safe and effective operation.

Except where otherwise indicated, completion of this form may be facilitated by ranking maintenance items on a 1 to 4 basis where

1 = satisfactory
2 = satisfactory, but check carefully at next inspection
3 = requires maintenance this season
4 = requires immediate attention.

204.10

WATERSHED Baker SITE 2 DATE 6-13-78

INSPECTED BY Gary Kerr, Lyall Milligan (WRB); Mike Dannehy, Nick Luhtala, Ray Wenninger (SCS)

1. GENERAL ITEMS

Access Road.	3
Site Fencing.	
Traffic Conditions.	1
Vandalism Control.	1
Trash Control.	1

COMMENTS Replace cable across top of dam at spillway and posts. General appearance good.

2. RESERVOIR

Timber stand at reservoir.	1
Debris and slash.	3
Sediment level in relation to low stage inlet	1

COMMENTS Some debris at riser should be removed.

SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

3. EMBANKMENT AND EXCAVATED SLOPES

(Report riprap and vegetation and erosion condition under Items 4 and 5.)

	Dam	ES Dike	Emergency Spillways left	Emergency Spillways right 1/	Other (____)	Other (____)
Sliding or sloughing	1	1	1	—	—	—
Holes (rodent and other) (check especially at embankments)	1	1	1	—	—	—
Excessive settlement (embankments)	1	1	1	—	—	—
Cracks						
Traverse	1	1	1	—	—	—
Longitudinal	1	1	1	—	—	—
Seepage 2/	1	1	1	—	—	—
Piping 2/	1	1	1	—	—	—

COMMENTS _____

4. RIPRAP

	Displ. of Rock	Loss of Spalls	Loss of Bedding	Erosion of Found.	Break-down of Rock
Dam					
Upstream berm	—	—	—	—	—
Principal Spillway Outlet	1	—	—	—	—
Embankment Gutters					
left	—	—	—	—	—
right	—	—	—	—	—
Emergency Spillway					
location _____	—	—	—	—	—
location _____	—	—	—	—	—
Waterways					
location 2d berm outlet	3	—	—	—	—
location _____	—	—	—	—	—
Outlet Channel	—	—	—	—	—
Other _____	—	—	—	—	—

COMMENTS Need a little rock and replacement at 2d berm outlet--not a big job.

1/Looking downstream.
2/Check especially at downstream face of embankments.

5. VEGETATION

	Dam	Emergency Spillways left	Emergency Spillways right 1/	Dike	Outlet Channel	Water way	Other (1st ES Berm)
Condition of stand (including need for lime and fertilizer)	—	—	—	—	—	—	—
Undesirable vegetation	—	(3)	—	—	—	—	—
Drainage (surface)	—	(4)	—	—	—	—	—
Erosion 2/	(3)	—	—	—	—	—	3
Sedimentation	—	—	—	—	—	—	—
Condition of planting	—	—	—	—	—	—	—
Pest control	—	—	—	—	—	—	—
Fire control	—	—	—	—	—	—	—

COMMENTS Spillway floor wetter than before. Vegetation dying out, scouring on outlet from water needs immediate attention. General vegetation on dam and trees look good. Brush on plunge pool outlet. Left downstream slope gutter needs 6"-12" rock, about 1' wide. Recommend a little rock at 1st berm outlet

6. EMBANKMENT, STRUCTURAL, & OTHER DRAINS

		Dam left	Dam right 1/	Other (lower es drain)	Other (upper es drain)
Depth of Flow (in inches above invert)	With any obstruction	—	—	—	—
	Without any obstruction	3/8"	3/8"	1/2"	1/2"
Turbidity of Discharge (yes, no)	With any obstruction	—	—	no	—
	Without any obstruction	no	no	no	no
Condition of Protective Coating	Outside	1	1	1	1
	Inside	—	—	—	1
Obstruction in Flow (yes, no)		no	no	yes	no
Animal Guard Condition		—	—	1	1
Outlet Condition		1	1	1	3

Retarding Pool Elevation (ft. msl)_____ or Approx. 1 (ft.) above ~~below~~ normal pool

Other_____

COMMENTS Spillway drain at ES floor partially plugged with pie plate. Removed it. Drain is okay. ½" depth of flow. No erosion at this outlet. Manholes on berm okay from exterior and listening to running water inside. Road culverts (up and downstream) appear okay.

1/Looking downstream.
2/Including wave, surface, stream, manmade, and livestock erosion.

7. RISER

Caution Be extremely careful when using ladders. Check condition before using. Ladders are sometimes broken, loose, corroded, and or slippery.
Use safcty harness.

Ladders: inside and out
Condition of protective coating___; Corrosion___; Damaged parts___; Loose___; Other___.

Concrete: ~~inside and~~ out
Cracking_/_; Spalling_/_; Other deterioration_/_; Excessive movement (check joint at riser and conduit)___; Other___.

Trashracks: low and high stage
Condition of protective coatings___; Corrosion_/_; Damaged parts_/_; Condition of fastenings_/_; Need of gratings due to beaver___; Safety condition (protruding fastenings, sharp edges, etc.)___; Other___.

Manhole:
Condition of protective coatings___; Corrosion___; Damage___; Lock operable___; Other___.

Gate: including lifting device, *stem, guides,* disc
Condition of protective coating___; Corrosion___; Damaged parts___; Condition of fastenings___; Stem alignment___; Lubrication___; Operation___; Other___.

Safety Items:
Condition of warning signs___; Condition of safety equipment___; Other___.

COMMENTS Did not go down riser. Suggest interior of riser and gate operation be checked at regular intervals.

IMPACT BASIN, SAF, BOX INLET, & MISCELLANEOUS CONCRETE STRUCTURES

(specify) IMPACT BASIN _____

Concrete: inside and out	Cracking 1; Spalling 1; Other deterioration 1; Excessive movement (check joints)___; Waterstops___; Joint sealant___; Other___.
Trashracks: low and high stage	Condition of protective coatings___; Corrosion ___; Damaged parts___; Condition of fastenings___; Need of gratings due to beaver___; Safety condition (protruding fastenings, sharp edges, etc.)___; Other___.
Gates: including lifting device, stem, guides, disc, flap	Condition of protective coating___; Corrosion ___; Damaged parts___; Condition of fastenings___; Stem alignment___; Operation___; Lubrication___; Wood decay___; Other___.
Structure Drainage:	Report under "Embankment and Other Drains"
Structure, Railing, Grates, Barriers, etc. Fence	Condition of protective coating 1; Corrosion 1; Damaged parts 1; Condition of Fastenings 1; Wood decay___; Safety condition (protruding fastenings, sharp edges, etc.) ____; Other___.
Safety Items:	Condition of warning signs___; Condition of safety equipment___; Other___.

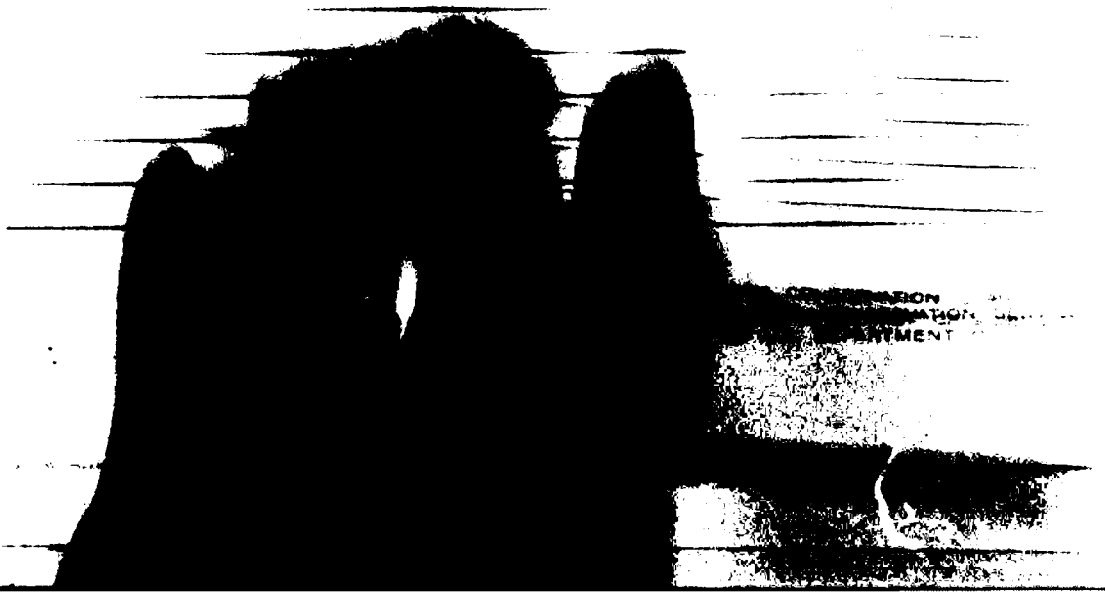
COMMENTS _____

9. CHANNEL

Stream obstructions.	1
Debris in stream.	1
Sediment bars controlled.	1
Plunge pool stability.	____
Fish habitat appurtenances	____

Riprap -- Report under "Riprap" (item 4)

COMMENTS _____



5/77

EMBANKMENT AND EXCAVATED SLOPES

(Report riprap and vegetation and erosion condition under Items 4 and 5.)

	Dam	Dike	Emergency Spillways left	Emergency Spillways right 1/	DOWNSTM WASTE (LEFT) AT SIDE	Other (____)
		EM.SP				
Sliding or sloughing	1	1	1	—	1	—
Holes (rodent and other) (check especially at embankments)	1	1	1	—	1	—
Excessive settlement (embankments)	1	1	1	—	1	—
Cracks						
Traverse	1	1	1	—	1	—
Longitudinal	1	1	1	—	1	—
Seepage 2/	1	1	2	—	2	—
Piping 2/	1	1	2	—	1	—

COMMENTS SMALL GULLY ALONG DOWNSTM TOE ON LEFT SIDE OF STREAM SHOULD BE WATCHED. THE OUTLET OF THIS GULLY INTO THE STREAM HAS BEEN RIPRAPPED. THIS NEEDS WATCHING, TOO. TWO SEEP AREAS ON DOWNSTM TOE OF WASTE AREA. SEEPAGE OCCURING ALONG TOE OF EM. SPILLWAY SLOPE IN EXIT CHANNEL. ALSO PILES OF FINES

4. RIPRAP

	Displ. of Rock	Loss of Spalls	Loss of Bedding	Erosion of Found.	Break-down of Rock
Dam					
Upstream berm	—	—	—	—	—
Principal Spillway Outlet	—	—	—	—	—
Embankment Gutters					
left	—	—	—	—	—
right	—	—	—	—	—
Emergency Spillway					
location _____	—	—	—	—	—
location _____	—	—	—	—	—
Waterways					
location ACCESS RD	1	1	1	1	1
location BERM	1	1	1	1	1
Outlet Channel	2	2	2	1	1
Other _____	—	—	—	—	—

COMMENTS REMOVE WOODY GROWTH FROM WATERWAY AT END OF ACCESS ROAD CULVERT

1/Looking downstream.
2/Check especially at downstream face of embankments.

VEGETATION

	Dam	Emergency Spillways left	Emergency Spillways right 1/	Dike	Outlet Channel	Water way	Other (_____)
Condition of stand (including need for lime and fertilizer)	1	1	—	—	1	—	—
Undesirable vegetation	1	1	—	—	2	—	—
Drainage (surface)	NA	2	—	—	NA	—	—
Erosion 2/	1	2	—	—	1	—	—
Sedimentation	1	1	—	—	1	—	—
Condition of planting	NA	2	—	—	NA	—	—
Pest control	1	1	—	—	NA	—	—
Fire control	—	—	—	—	—	—	—

COMMENTS DRAINAGE WILL BE NECESSARY IN ORDER TO KEEP A SATISFACTORY GRASS SOD ON OUTLET END OF EMERGENCY SPILLWAY.

CROWN VETCH SPREADING OVER DAM FALLS. TREFOIL THINNING

6. EMBANKMENT, STRUCTURAL, & OTHER DRAINS

		Dam left	Dam right 1/	Other (_____)	Other (EM. SP FLOOR DRAIN) (_____)
Depth of Flow (in inches above invert)	With any obstruction	—	—	—	3
	Without any obstruction	1/2	1/2	—	2
Turbidity of Discharge (yes, no)	With any obstruction	NO	NO	—	1
	Without any obstruction	NO	NO	—	—
Condition of Protective Coating	Outside	1	1	—	2
	Inside	1	1	—	2
Obstruction in Flow (yes, no)		NO	NO	—	YES
Animal Guard Condition		1	1	—	—
Outlet Condition		1	1	—	1

Retarding Pool Elevation (ft. msl)_____ or_____(ft.) above / below _____

Other_____

COMMENTS THERE IS A 3/4 IN. Ø PIPE INSTALLED IN THE OUTLET END OF THE EM. SP. FLOOR DRAIN.

1/Looking downstream.
2/Including wave, surface, stream, manmade, and livestock erosion.

RISER

Caution Be extremely careful when using ladders. Check condition before using. Ladders are sometimes broken, loose, corroded, and or slippery.
Use safety harness.

Ladders: inside and out	Condition of protective coating___; Corrosion___; Damaged parts___; Loose___; Other___.
Concrete: inside and out	Cracking___; Spalling___; Other deterioration ___; Excessive movement (check joint at riser and conduit)___; Other___.
Trashracks: low and high stage	Condition of protective coatings___; Corrosion ___; Damaged parts___; Condition of fastenings ___; Need of gratings due to beaver___; Safety condition (protruding fastenings, sharp edges, etc.)___; Other___.
Manhole:	Condition of protective coatings___; Corrosion ___; Damage___; Lock operable___; Other___.
Gate: including lifting device, stem, guides, disc	Condition of protective coating___; Corrosion ___; Damaged parts___; Condition of fastenings___; Stem alignment___; Lubrication___; Operation___; Other___.
Safety Items:	Condition of warning signs___; Condition of safety equipment___; Other___.

COMMENTS WRB PERSONNEL WILL CHECK RISER AND APPURTENANCES LATER. THE TOP OF THE RISER IS STAINED. IT APPEARS THAT SOMEONE MAY HAVE BUILT A FIRE ON THE TOP SLAB. THE STAIN CONTINUES DOWN THE FRONT FACE OF THE RISER. THE CONCRETE SHOULD BE CHECKED FOR DAMAGE.

IMPACT BASIN, SAF, BOX INLET, & MISCELLANEOUS CONCRETE STRUCTURES

(specify) IMPACT BASIN

Concrete: inside and out	Cracking 1; Spalling 2; Other deterioration 2; Excessive movement (check joints) 1; Waterstops 1; Joint sealant 1; Other___.
Trashracks: low and high stage	Condition of protective coatings___; Corrosion___; Damaged parts___; Condition of fastenings___; Need of gratings due to beaver___; Safety condition (protruding fastenings, sharp edges, etc.)___; Other___.
Gates: including lifting device, stem, guides, disc, flap	Condition of protective coating___; Corrosion___; Damaged parts___; Condition of fastenings___; Stem alignment___; Operation___; Lubrication___; Wood decay___; Other___.
Structure Drainage:	Report under "Embankment and Other Drains"
Structure, Railing, Grates, Barriers, etc.	Condition of protective coating 1; Corrosion 1; Damaged parts 1; Condition of Fastenings 1; Wood decay___; Safety condition (protruding fastenings, sharp edges, etc.) 1; Other___.
Safety Items:	Condition of warning signs___; Condition of safety equipment___; Other___.

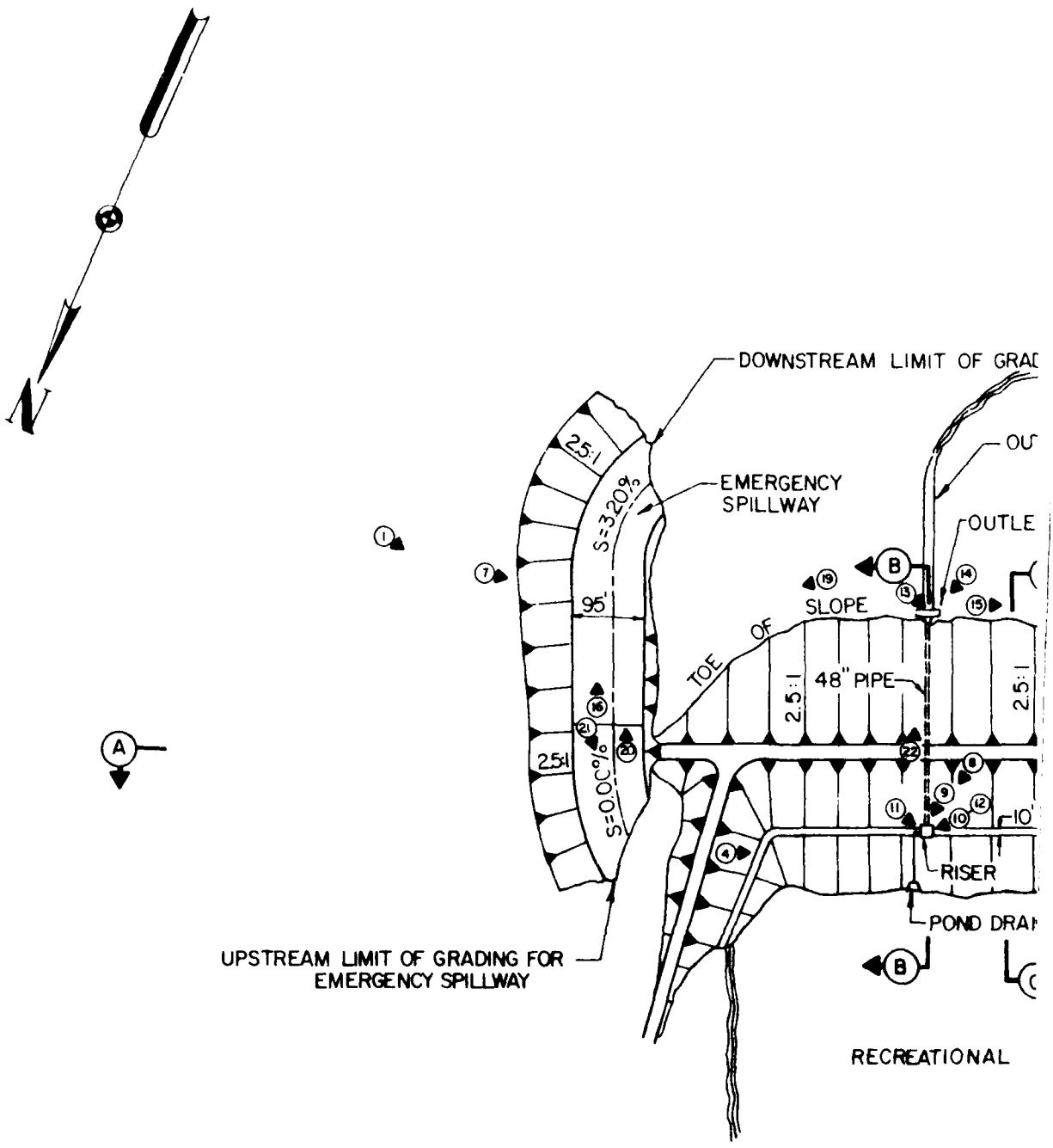
COMMENTS THERE IS SOME SPALLING AROUND THE P.S. PIPE. THERE IS A POCKMARK ON THE TOP SURFACE OF THE BAFFLE

9 CHANNEL

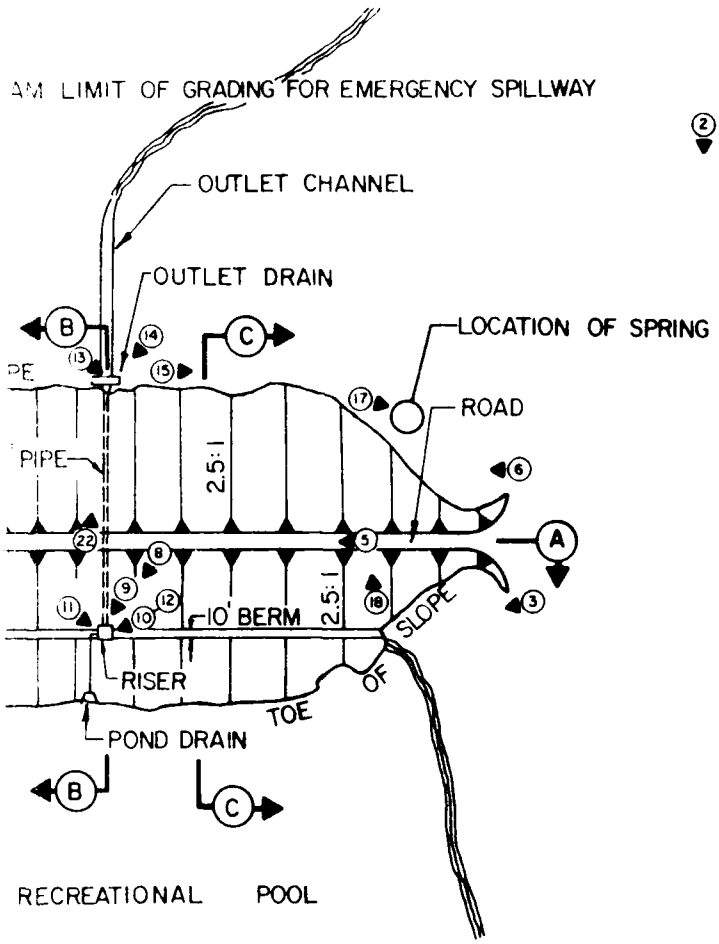
Stream obstructions.	1
Debris in stream.	1
Sediment bars controlled.	2
Plunge pool stability.	1
Fish habitat appurtenances	

Riprap -- Report under "Riprap" (item 4)

COMMENTS



PLAN



LEGEND

② INDICATES LOCATION WHERE PHOTO WAS TAKEN AND DIRECTION

1 THE INFORMATION SHOWN ON THESE DRAWINGS IS BASED ON THE ORIGINAL CONSTRUCTION PLANS AND VISUAL OBSERVATIONS MADE DURING THE FIELD INSPECTION. DIMENSIONS OR MATERIALS INDICATED ON THESE DRAWINGS WHICH WERE BELOW GRADE OR WATER DURING THE TIME OF INSPECTION WERE NOT VERIFIED

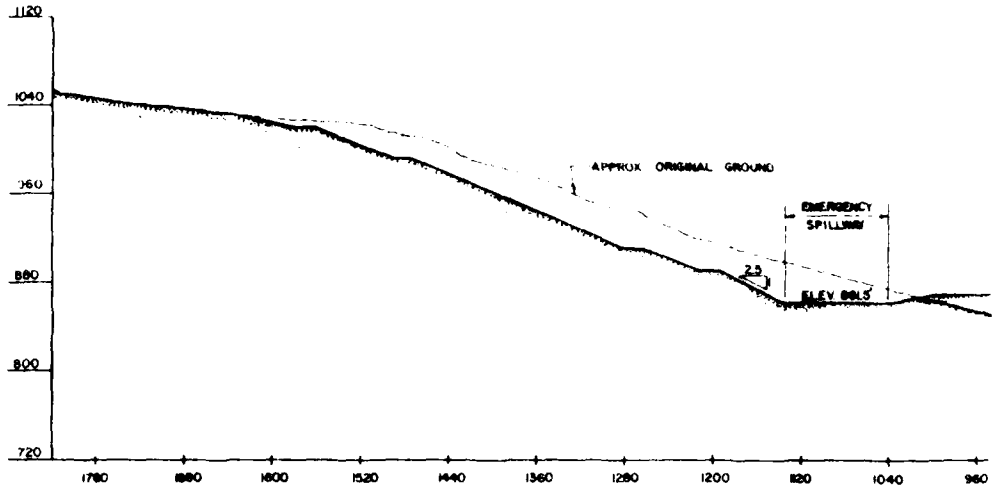
2 THE ELEVATIONS SHOWN ARE 1929 MSL DATUM

PLAN

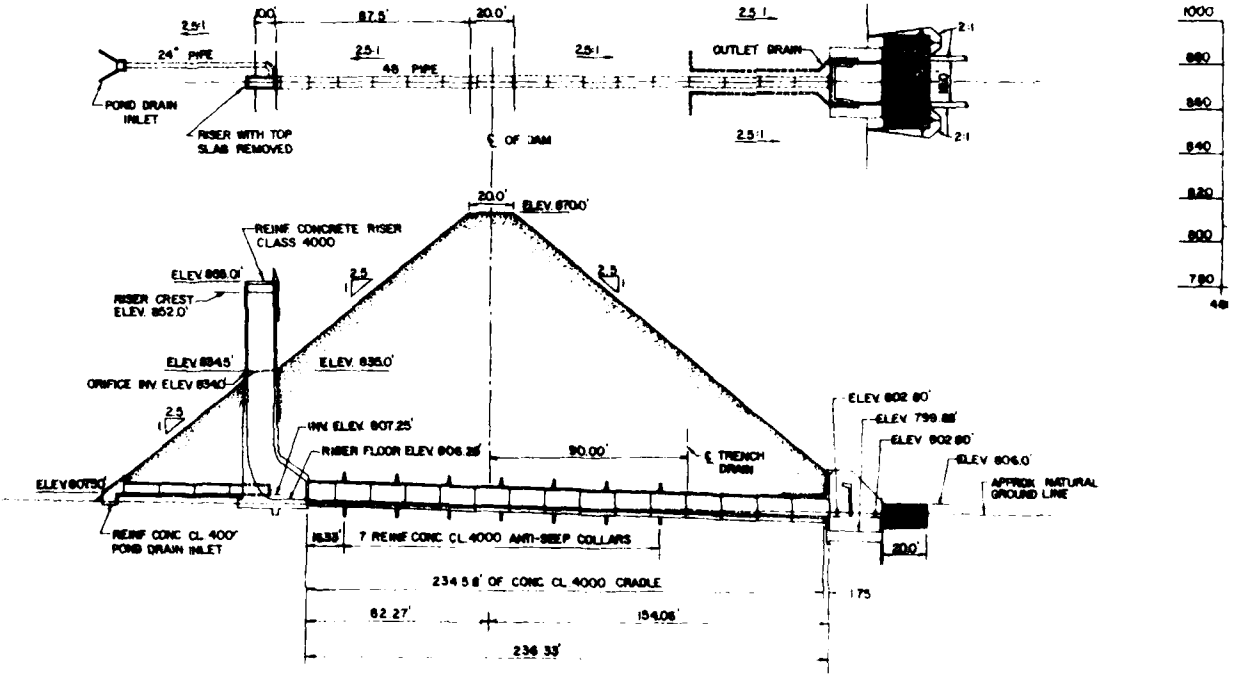
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

SITE NO. 2
BAKER FLOODWATER RESERVOIR

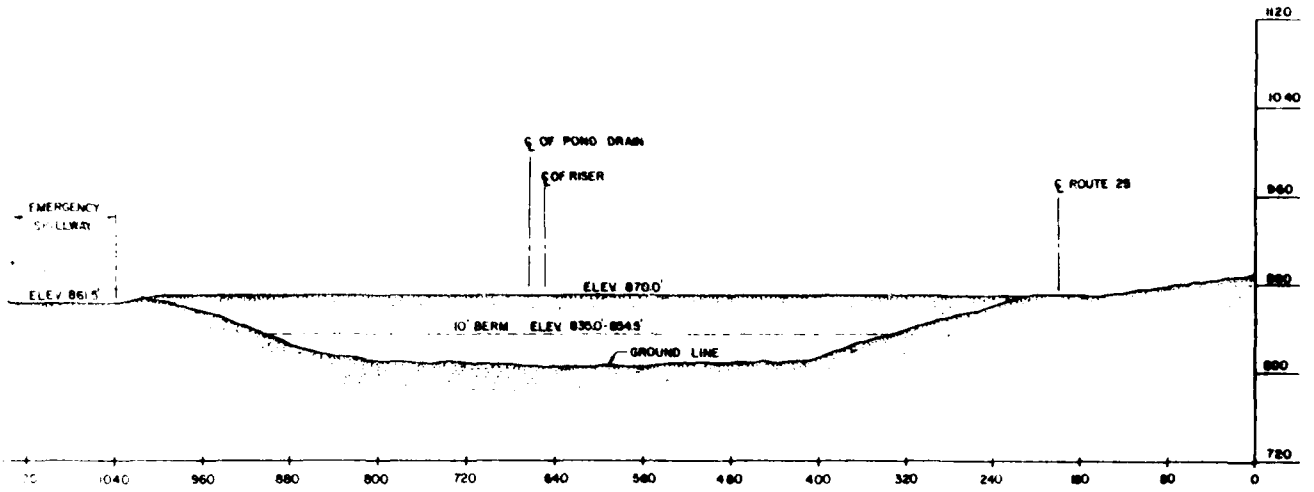
Figure 1 of 2



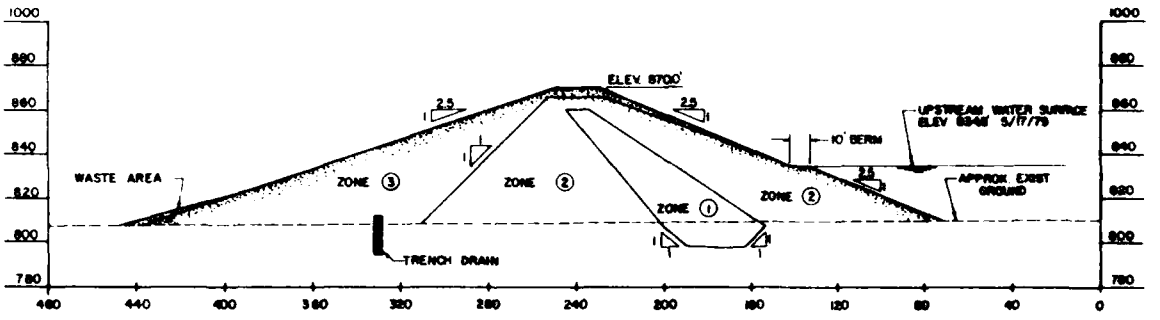
SECTION



SECTION B-B



SECTION A-A



SECTION C-C

1 THE INFORMATION SHOWN
BASED ON THE ORIGINAL
AND VISUAL OBSERVATIO
FIELD INSPECTION. DIME
INDICATED ON THESE DR
BELOW GRADE OR WATER
INSPECTION WERE NOT V

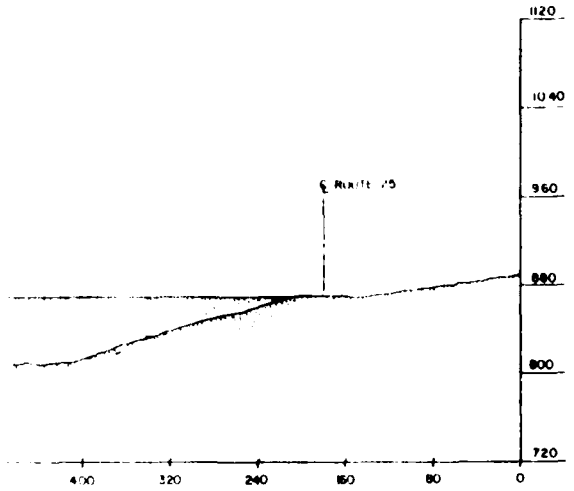
2. THE ELEVATIONS SHOWN

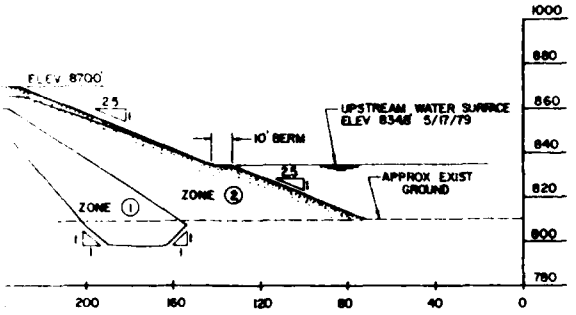
FROM NATURAL
GROUND LINE

EARTH FILL REQUIREMENTS			
ZONE	MATERIAL	REQUIRED WATER CONTENT	COMPACTION DEFINITION
1	SAND, SILTY, FINE	OPTIMUM TO +4% OF OPTIMUM	100% MAXIMUM DENSITY BY ASTM D698 METHOD A
2	SANDS AND GRAVELS, SILTY	OPTIMUM TO +4% OF OPTIMUM	100% MAXIMUM DENSITY BY ASTM D698 METHOD A
3 AND ACCESS ROAD	GRAVELS	5% TO 11% BY DRY WGT FOR MATRIX (MAT < 3/4")	SEE CONST SPEC 5

NATIONAL PROGRAM OF INS
SITE N
BAKER FL
RESERV

Figure 2





C-C

1. THE INFORMATION SHOWN ON THESE DRAWINGS IS BASED ON THE ORIGINAL CONSTRUCTION PLANS AND VISUAL OBSERVATIONS MADE DURING THE FIELD INSPECTION. DIMENSIONS OR MATERIALS INDICATED ON THESE DRAWINGS WHICH WERE BELOW GRADE OR WATER DURING THE TIME OF INSPECTION WERE NOT VERIFIED.
2. THE ELEVATIONS SHOWN ARE 1929 MSL DATUM.

REMENTS	
TER T	COMPACTION DEFINITION
+4% UM	100% MAXIMUM DENSITY BY ASTM D698 METHOD A
+4% UM	100% MAXIMUM DENSITY BY ASTM D698 METHOD A
RY WGT AT < 3/4")	SEE CONST SPEC 5

US ARMY ENGINEER DIV NEW ENGLAND

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

SITE NO. 2
BAKER FLOODWATER RESERVOIR

Figure 2 of 2

APPENDIX C

PHOTOGRAPHS

FOR LOCATION OF PHOTOS, SEE FIGURE 1
LOCATED IN APPENDIX B

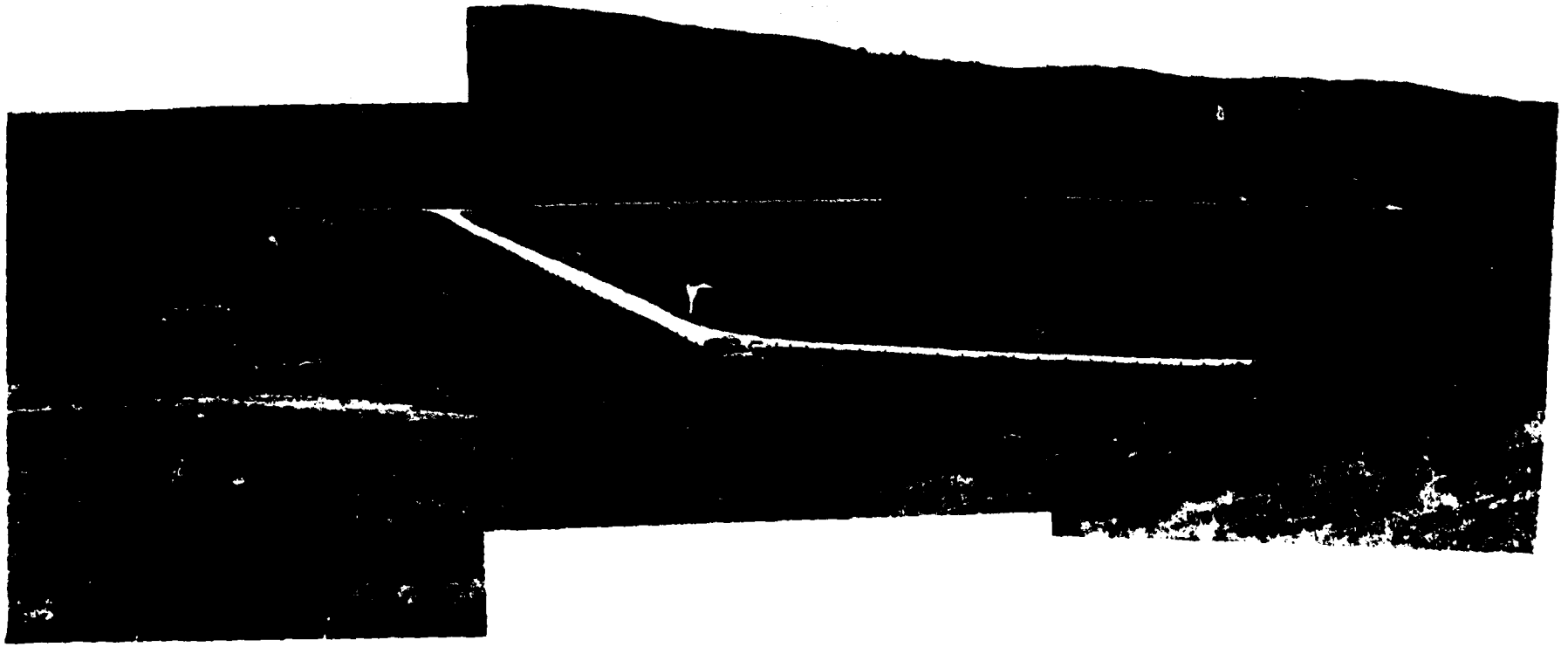


PHOTO NO. 1 - General view of dam and reservoir.

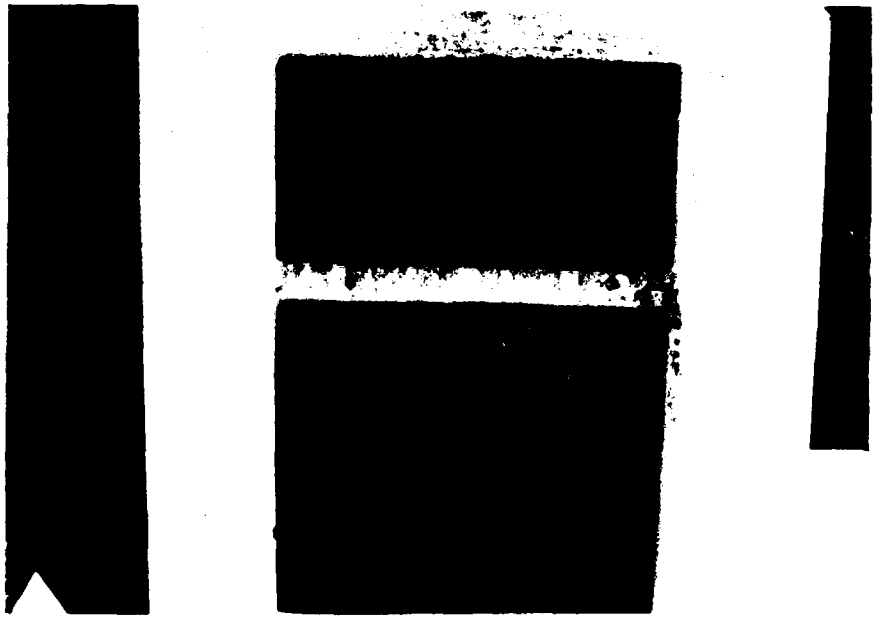


PHOTO NO. 2 - Dedication and information monument.

PHOTO NO. 3 - View of upstream slope from right abutment.

PHOTO NO. 4 - View of upstream face of dam from left abutment.

PHOTO NO. 5 - View from right abutment of dam crest and roadway.

PHOTO NO. 6 - View of downstream slope of dam from right abutment.

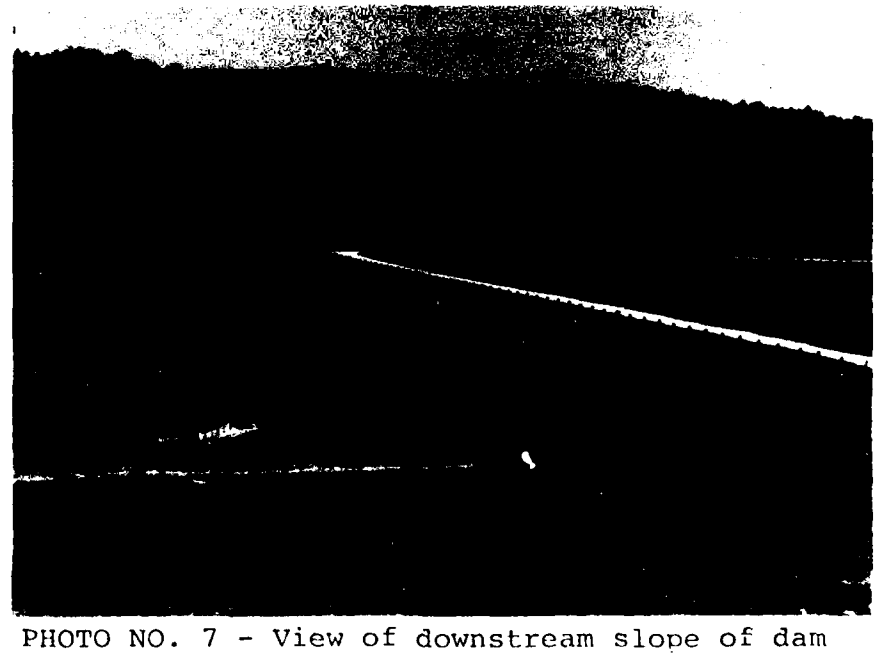


PHOTO NO. 7 - View of downstream slope of dam from glacial erratic on left abutment.

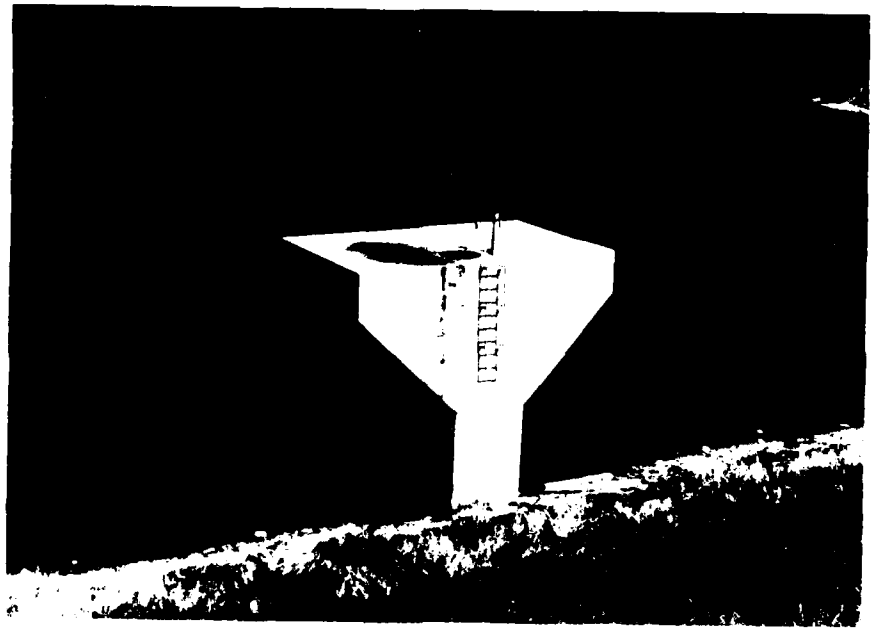


PHOTO NO. 8 - View of riser and covered high stage inlet from dam.

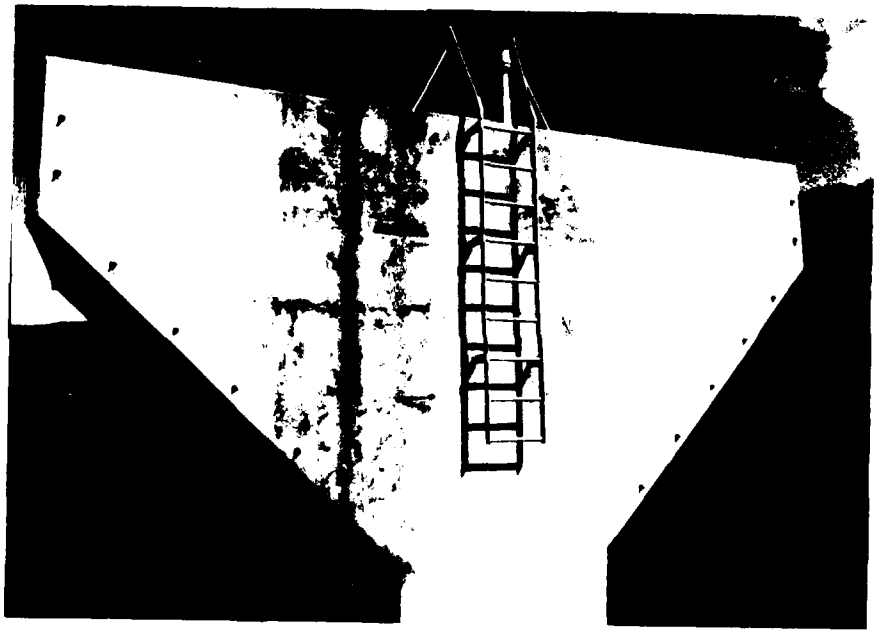


PHOTO NO. 9 - View covered high stage inlet.

PHOTO NO. 10 - View of right side of riser and high stage trash rack.

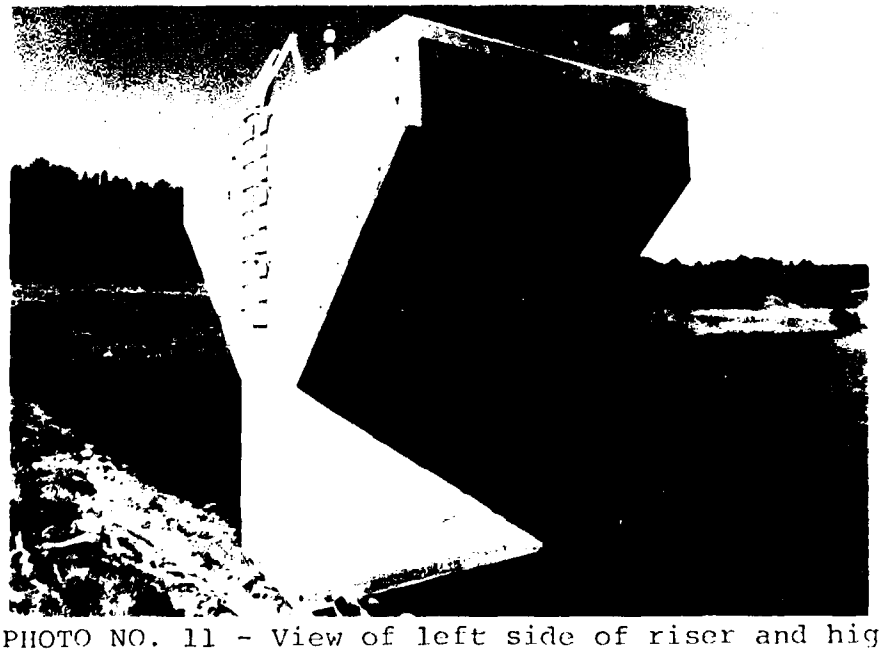


PHOTO NO. 11 - View of left side of riser and high stage trash rack.

PHOTO NO. 12 - Close up view of riser structure.

PHOTO NO. 13 - View of outlet of principal spillway outlet pipe.

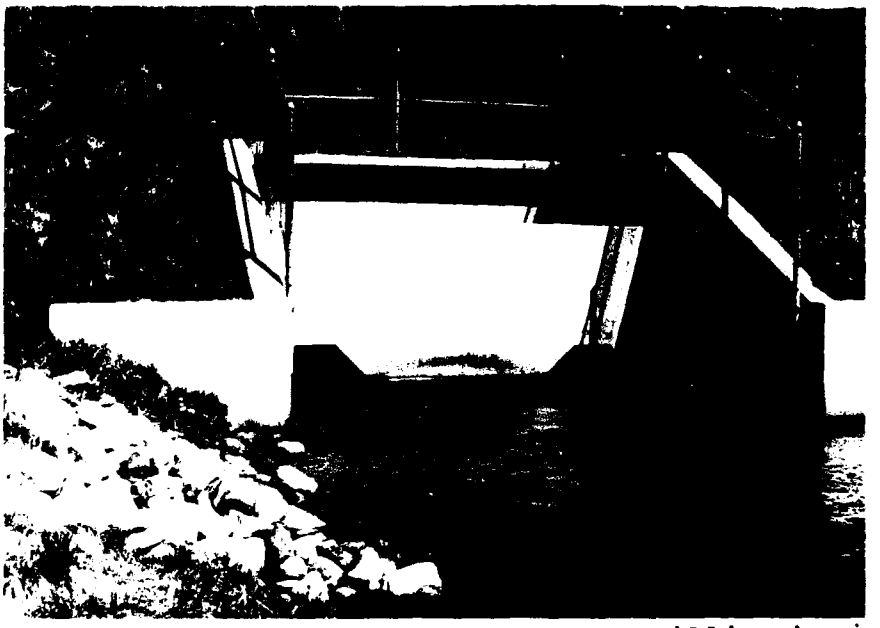


PHOTO NO. 14 - View of impact type stilling basin.

PHOTO NO. 15 - View of vegetation along drainage of seep, juncture of embankment toe and right abutment.

PHOTO NO. 16 - Wet area in emergency spillway 100 feet downstream from axis of dam.

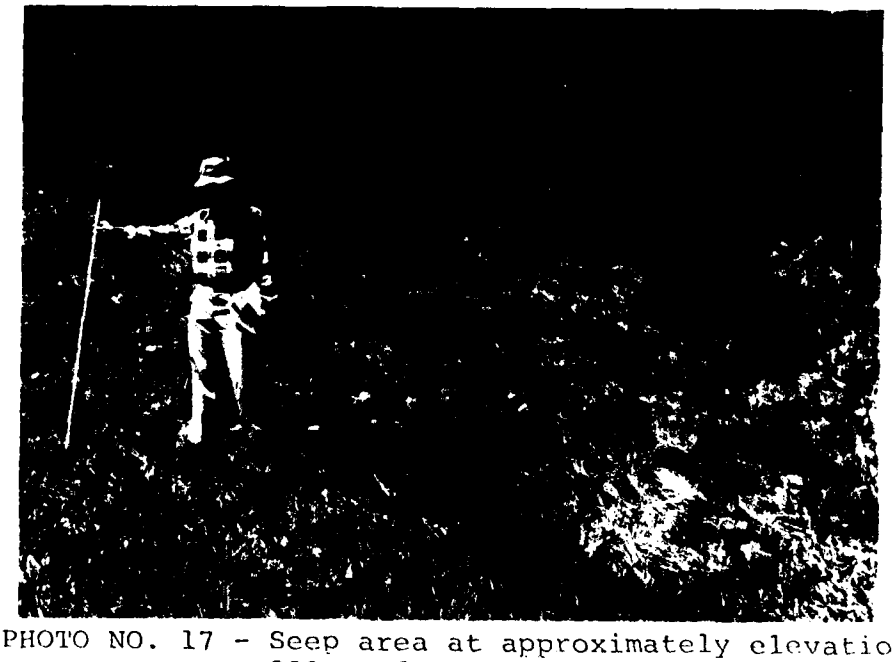


PHOTO NO. 17 - Seep area at approximately elevation 832 on downstream side of right abutment.

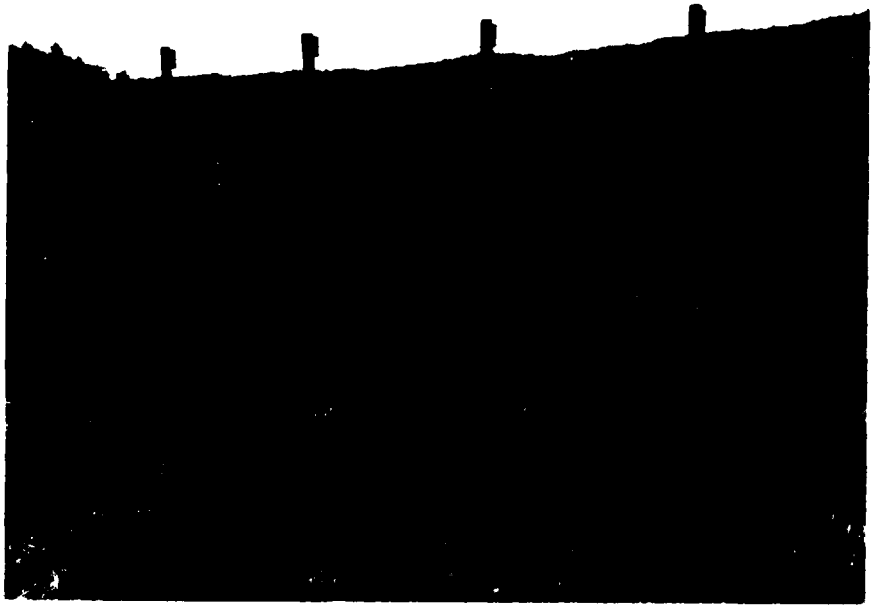


PHOTO NO. 18 - View of upstream slope near right abutment.

PHOTO NO. 19 - Surface of erosion gully at contact between the downstream slope and the left abutment. Stones have been placed in the gully at several points.

PHOTO NO. 20 - View of downstream portion of emergency spillway from axis of dam.

PHOTO NO. 21 - View of upstream portion of emergency spillway from axis of dam.

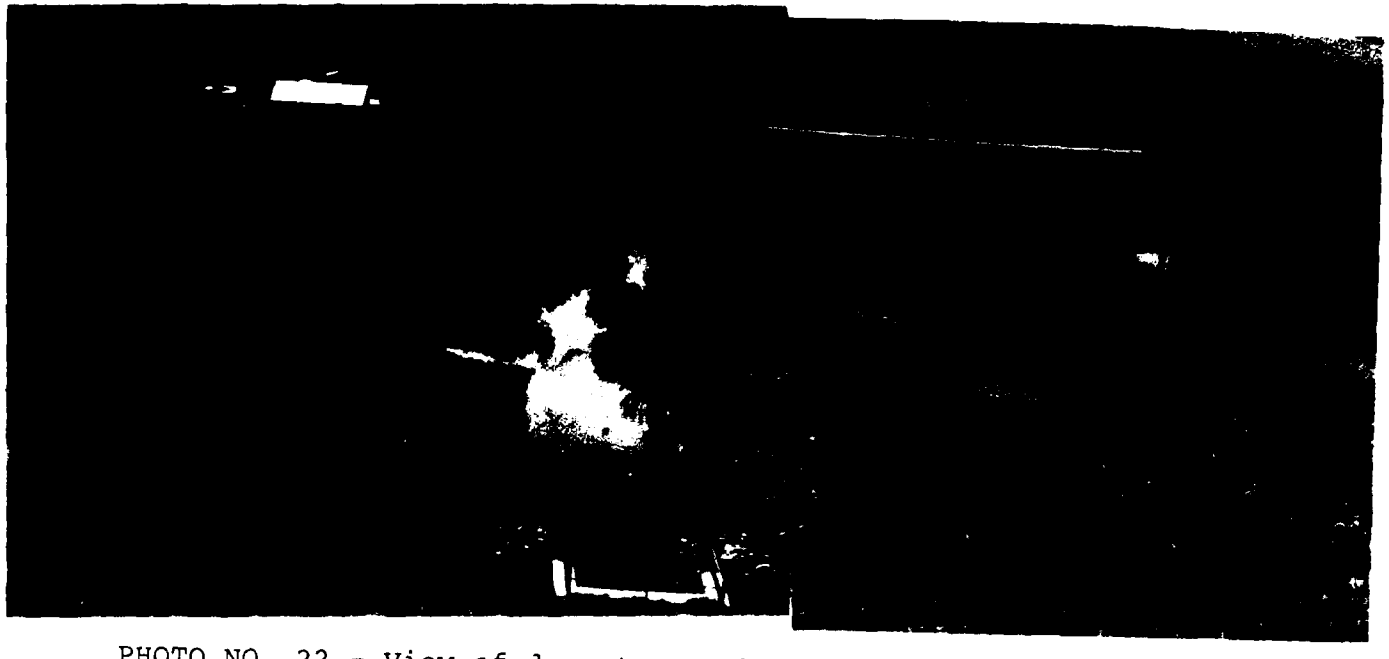


PHOTO NO. 22 - View of downstream channel and surrounding area of dam.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/29/79	Job No 5965-11-02
	Checked by DWB	Date 6/13/79	Sheet No 1
For Baker Dam Site #2			

HYDRAULICS & HYDROLOGY

Baker River Dam Site #2 Located across Berry Brook in Town of Warren N.H. in the Merrimack River Basin

Classification Size - Intermediate
Hazard High

Basic Data D.A. 6.64 Square Miles
Upstream Basin : Mountainous
Slope 400'+ per mile

Reservoir : Recreation elev: 834.0
Storage 500 acre-ft

Max (top of dam) elev. 870
Storage 1848 acre ft
Surface area 68 acres

Dam : Earth
Length 805 ft
height 68 ft

Spillway Riser : crest 852.0
length 24 ft
Emergency crest 861.5
width 95 feet

See Appendix "B" for Plan of Dam

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/29/79	Job No 5965.11-02
	Checked by [illegible]	Date 6/13/79	Sheet No 2
For Baker #2			

Step 1 Calculation of Test Flood Inflow

Classification: Size - Intermediate
Hazard: High

Hydrologic Evaluation Guideline Recommends

PMF for Test Flood Inflow

Use Mountainous Curve as ave stream slope is 400+ feet/mi.

Test Flood = 2120 csm × 6.64 sq mi = 14,100 cfs.
at 19" runoff.

As this is a flood control reservoir the portion of the storage above the recreational pool can be used to store a portion of the PMF

500 acre-ft at recreation pool
1880 acre ft at crest of emergency spillway
1380 acre ft available to store PMF

Volume of PMF $19"/12 \frac{in}{ft} \times 640 \frac{acres}{mi^2} \times 6.64 \, sq\,mi$

= 6728 acre-ft

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/21/79	Job No 395-1-02
	Checked by [illegible]	Date 5/13/79	Sheet No 3
For Baker #2			

Step 2 Calculation of Test Flood Surcharge

Stage - Discharge Curve

Elev	ft above Emerg. Spillway	A Riser Pipe Flow	B Emergency Spillway	C Crest of Dam	Total
861.5 ft MSL	0 ft	439 cfs	-	-	439 cfs
863.0	1.5	445	280 cfs	-	725
865.0	3.5	453	1355	-	1809
867.0	5.5	460	3039	-	3499
869.0	7.5	467	5326	-	5793
871.0	9.5	475	8182	2487 cfs	11,144
871.86	10.36	478	9500	6039	16,017

A. From Baker River #2 Design Book, SCS Durham, NH
See SCS calcs. at the end of this section

B. From Baker River #2 Design Book - Revised from 80' wide spillway to 95' wide as built spillway.

C. Computed as flow over Broad-crested weir

$Q = CLH^{3/2}$

$C = 3.09$

$L = 805'$

$Q = 2487\, H^{3/2}$

See figure 2 for Plot

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/31/79	Job No 5965-11-02
	Checked by [illegible]	Date 6/13/79	Sheet No 4
For Baker #2			

Step 3 Estimate of Surcharge Storage Effect

Q_{P_1} = 14,100 cfs Runoff = 19.0 inches

$$Q_{P_2} = Q_{P_1} \times \left(1 - \frac{Stor}{19}\right)$$

Stor in acre-ft read from figure 1. — 500 acre ft

$$Stor_{in} = \frac{Stor_{(acre\,ft)} \times 12\ in/ft}{6.64\ sq\,mi. \times 640\ acre/mi^2} = Stor\,(2.82 \times 10^{-3})$$

Elev	Stor acre-ft	Stor (in.)	Q_{P_2}
862.0	1400 acre ft	3.95 in	11,170 cfs
865	1590	4.48	10,770
867	1720	4.85	10,500
871.5	2020	5.70	9870
869.0	1850	5.22	10,230

See figure 2 for plot and final outflow.

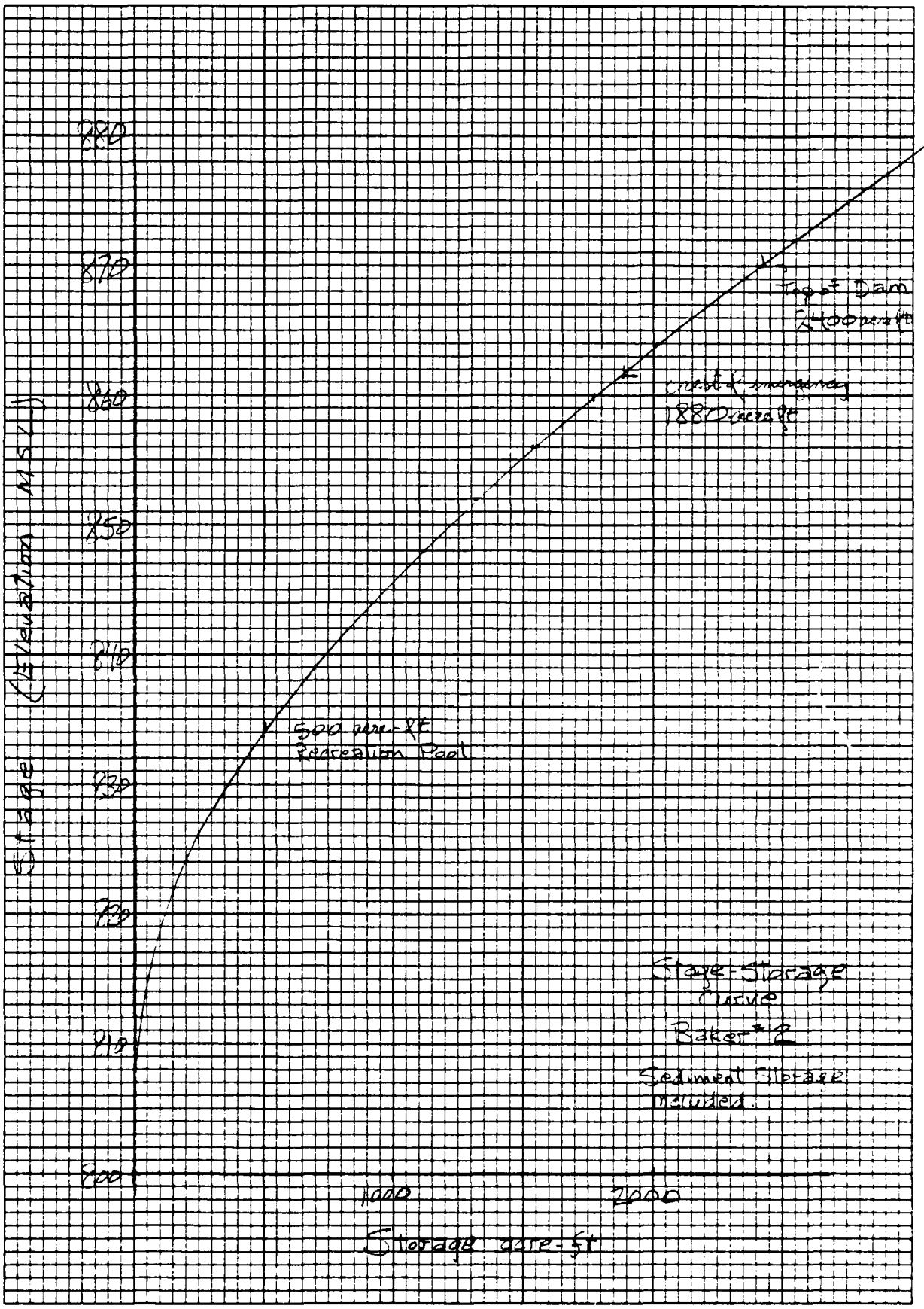
From Figure 2 Outflow = 10,000 cfs

Stage = 870.8 ft

or 0.8 above crest of dam.

Spillway Capc. at test flood 22[illegible] cfs

Ht top of dam spillway 67% of TFI



10x10 TO THE INCH

Stage (ft above arbitrary datum)
Discharge (cfs)
Rating Curve
Full Pipe
Rating Curve
Partial Pipe
Outflow
Inflow
Storage (cu ft)

Figure 2

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/27/79	Job No 5965-11-02
	Checked by JWPD	Date 6/12/79	Sheet No 5
For Baker II Z			

Estimate of Downstream Damage

Step 1 Reservoir Storage

Top of Dam @ elev 870.0

Storage 2400 acre ft includes sedimentation allowance

Step 2 Breach Outflow

$Q_{Breach} = 8/27 \sqrt{g}\, Y_o^{3/2} w_o$

w_o = 40% of length of dam = (.40)(805)

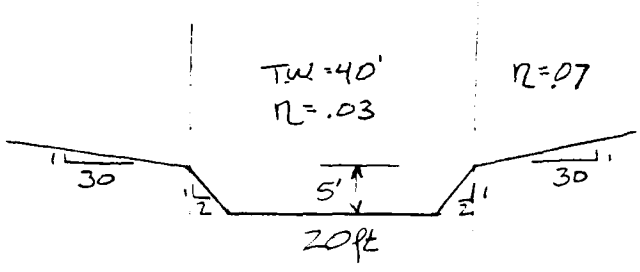
Y_o = height of streambed to max pool = 68 ft

$Q_{Breach} = 8/27 \sqrt{g}\,(.40)(805)(68)^{3/2} = 303{,}300$ cfs

$Q_{spillway} =$ 6700

$Q_{P_1} = 310{,}000$ cfs

Step 3 Stage - Discharge



Reach 1 = 3500 ft

S_{ch} = .0111 ft/ft

n_{ch} = .03

n_{OB} = .07

Stage	Discharge
10 ft	10,600 cfs
15	35,600
20	84,900
25	165,000
30	282,000
32	340,000

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/29/79	Job No 5965-11-02
	Checked by [illegible]	Date 6/13/79	Sheet No 6
For Baker #2			

Step 4 Reach Outflow S = 2400

$Q_{P_1} = 310{,}000$ cfs

Reach 1A Stage$_1$ = 31.0 ft area = 21,470 ft^2

$V_1 = \frac{3500 \times 21{,}470}{43560} = 1725 \geq \frac{2400}{2}$

Reach to long

1700' of 3500' $V_2 = \frac{1700 \times 21470}{43{,}560} = 838$ acre ft

$Q_{P_{2T}} = 310{,}000\left(1 - \frac{838}{2400}\right) = 201{,}800$ cfs

Stage$_2$ = 26.7 ft area$_2$ = 15144 ft^2

$V_2 = \frac{1700 \times 15{,}144}{43560} = 591$ acre ft

$V_{ave} = 714$ acre ft

$Q_{P_2} = 310{,}000\left(1 - \frac{714}{2400}\right) = 217{,}800$ cfs = Q_{P_1} reach 1B

Reach 1B Lower 1800' of 3500' Stage$_1$ = 27.4 ft area$_1$ = 16,100 ft^2

$V_1 = \frac{1800 \times 16{,}100}{43560} = 665$ acre-ft

$Q_{P_{2T}} = 217{,}800\left(1 - \frac{665}{2400}\right) = 157{,}400$ cfs

Stage$_2$ = 24.5 ft area$_2$ = 12,337 ft^2

$V_2 = \frac{1800 \times 12337}{43560} = 510$ acre-ft

$V_{ave} = 587$ acre-ft

$Q_{P_2} = 217{,}800\left(1 - \frac{587}{2400}\right) = 164{,}500$ cfs.

Stage 25 ft

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/29/79	Job No 5965-11-02
	Checked by [illegible]	Date 6/13/79	Sheet No 7
For Baker #2			

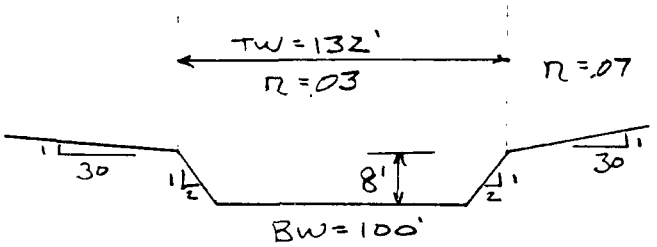
Step 3 for Reach 2 Baker River

$L = 13{,}700$ ft

$S_{ch} = .01159$ ft/ft

$n_{ch} = .03$

$n_{OB} = .07$



Stage - Discharge

10 ft	27,500 cfs
15	64600
20	127,200
25	222,500
30	356,500

Step 4 Reach Outflow

$Q_{P_1} = 164{,}500$ cfs

$Stage_1 = 22.2$ ft $area_1 = 8851$ ft^2

Read 2A

5000' of 13,700'

$V_1 = \frac{5000' \times 8851}{43560} = 1016$ acre ft $\leq \frac{2400}{2}$ Reach OK

$Q_{P_{2T}} = 164{,}500\left(1 - \frac{1016}{2400}\right) = 94{,}900$ cfs

$Stage_2 = 17.6$ ft $area_2 = 4960$ ft^2

$V_2 = \frac{5000 \times 4960}{43560} = 569$ acre ft

$V_{ave} = 793$ acre-ft

$Q_{P_2} = 164{,}500\left(1 - \frac{793}{2400}\right) = 110{,}100$ cfs

$Stage = 18.8$ ft

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/29/79	Job No 5965-11-02
	Checked by RWB	Date 6/13/79	Sheet No 2
For Baker = 2			

Reach 2B $Q_{P_1} = 110{,}100$ cfs

Stage$_1$ = 18.8 ft area$_1$ = 5853 ft^2

Sensor 8700'
R 13700'

$$V = \frac{8700 \times 5853}{43560} = 1169 \text{ acre ft} \approx \frac{2400}{2}$$

$$Q_{P_{2T}} = 110{,}100\left(1 - \frac{1169}{2400}\right) = 56{,}500 \text{ cfs}$$

Stage$_2$ = 14.1 ft area$_2$ = 2850 ft^2

$$V_2 = \frac{8700 \times 2850}{43560} = 569 \text{ acre ft}$$

V_{ave} = 869 acre ft

$$Q_{P_2} = 110{,}100\left(1 - \frac{869}{2400}\right) = 70{,}200 \text{ cfs}$$

Stage = 15.6 ft

Summary

Reach	Stage
At Dam	31.0 ft
Confluence w/ Babcock River	25.0 ft
At Route 25 1.6 mi d.s. of dam	18.8 ft
At Route 25 7.3 mi d.s. of dam	15.6 ft

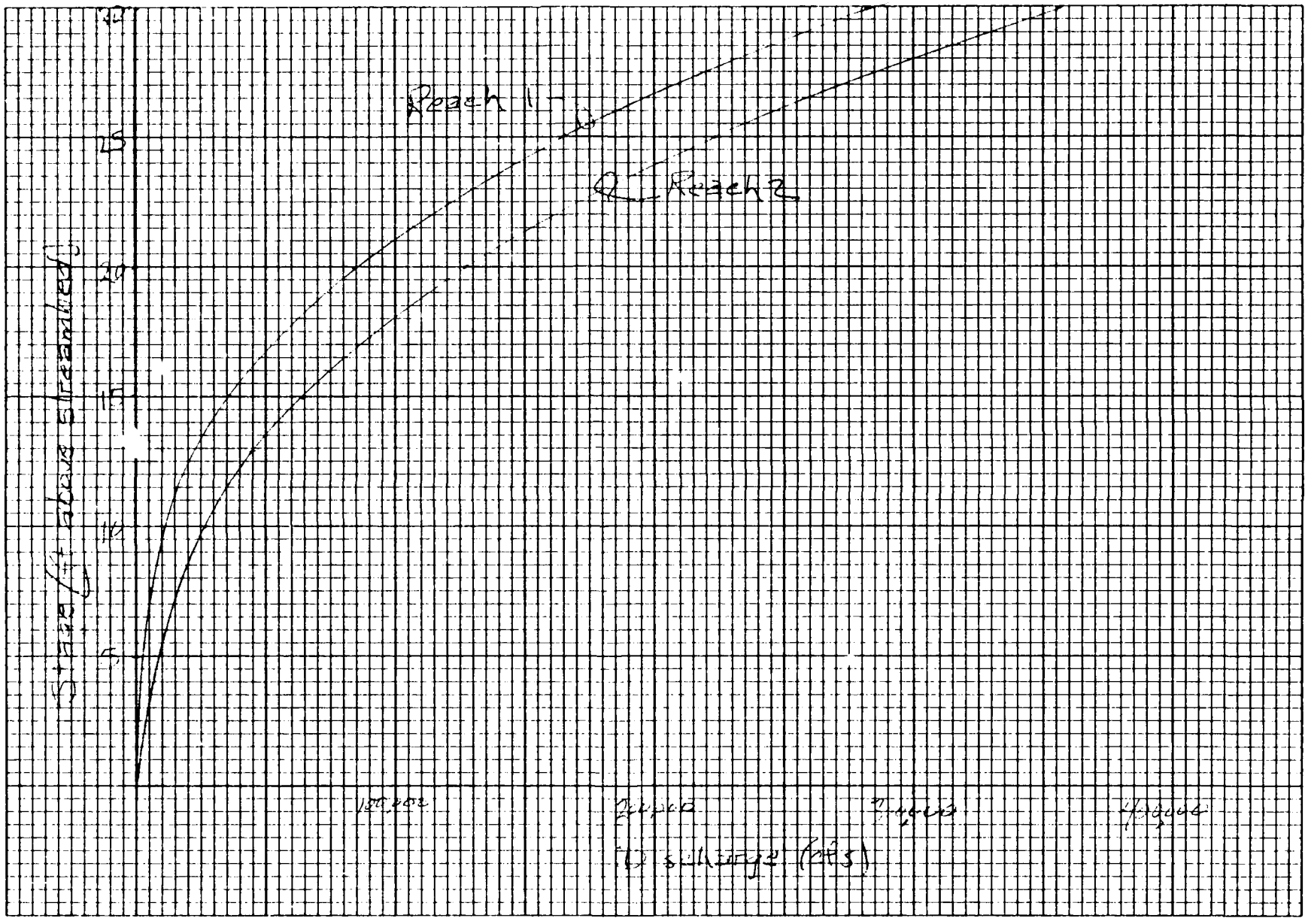


Figure 3

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by	Date 6/5/79	Job No 5965-11-02
	Checked by	Date 6/13/79	Sheet No 9
For Baker #2			

Estimate of Surcharge Storage Effect with ½ PMF

PMF = 14,100 cfs ½ PMF = 7050 cfs see pg 2

Uncontrolled Runoff with ½ PMF

½ PMF Volume 3864 acre ft see pg 2
Reservoir Storage 500 acre ft

for Stor(in) See page 4

RO = 9.5 inches

$Q_{P_2} = Q_{P_1} \times \left(1 - \frac{Stor}{9.5}\right)$

See pg 4

Elev	Stor (in)	Q_{P_2} ½ PMF
862.0	3.95	4120 cfs
865.0	4.48	3720
867.0	4.85	3450
869.0	5.22	3180
871.5	5.70	2820

See Figure 2 for plot and final ½ PMF outflow

½ PMF Outflow 3460 cfs

Stage 867.0

Freeboard 3.0 ft

By	Date	Checked By	Date	Job No.
Subject WORK PLAN - DESIGN COMPARISON				Sheet of

ITEM	UNIT	WORK PLAN	DESIGN	COMMENTS
DRAINAGE AREA	SQ.MI	[illegible]	[illegible]	
STORAGE CAPACITY				
SEDIMENT (INC. AERATED)	AC.FT.	82	82	
BENEFICIAL	AC.FT.	[illegible]	[illegible]	
RETARDING	AC.FT.	[illegible]	[illegible]	
TOTAL	AC.FT.	[illegible]	[illegible]	
BETWEEN HIGH & LOW S.	AC.FT.	[illegible]	[illegible]	
SURFACE AREA				
NORMAL POOL	ACRE	[illegible]	[illegible]	
RETARDING POOL	ACRE	[illegible]	61	
DESIGN HIGH WATER	ACRE	-	87	
VOLUME OF FILL	CU.YD.	[illegible]		
TOP OF DAM ELEV	FEET	[illegible]	[illegible]	
MAX. HEIGHT OF DAM	FEET	[illegible]	[illegible]	
EMERGENCY SPILLWAY				
CREST ELEVATION	FEET	863.0	861.5	
BOTTOM WIDTH	FEET	100	100	
TYPE	—	Earth	Earth	
PERCENT CHANCE OF USE	—	1	<1	
AVE. CURVE NO. COND. II	—	67	67	
EM. SP. HYDROGRAPH				ES 0.20 [illegible]
STORM RAINFALL - 6 HR.	IN.	8.75	[illegible]	
STORM RUNOFF	IN.	[illegible]	3.21	
VELOCITY OF FLOW - V	FPS	[illegible]	[illegible]	
PEAK DISCHARGE RATE	CFS	[illegible]	[illegible]	
MAX. WATER SURFACE EL.	FEET	[illegible]		
FREEBOARD HYDROGRAPH				ES 1000 [illegible]
STORM RAINFALL - 6 HR.	IN.	[illegible]	[illegible]	
STORM RUNOFF	IN.	[illegible]	[illegible]	
VELOCITY OF FLOW - V	FPS	[illegible]		
PEAK DISCHARGE RATE	CFS	[illegible]		
MAX. WATER SURFACE EL.	FEET	[illegible]	[illegible]	[illegible]
PRINCIPAL SPILLWAY				Emergency
RISER SIZE	FT.		[illegible]	
MAX. LOW STAGE FLOW	CFS	[illegible]	[illegible]	[illegible]
ORIFICE SIZE	FT.		[illegible]	[illegible]
MAX. HIGH STAGE FLOW	CFS	[illegible]	[illegible]	
PIPE SIZE	DIA		[illegible]	
CAPACITY EQUIVALENTS				
TOTAL SEDIMENT VOL.	IN.	[illegible]	[illegible]	
RETARDING STORAGE	IN.	[illegible]	[illegible]	
EM. SPILLWAY STORAGE TO TOP OF DAM	IN.	[illegible]	[illegible]	
CLASS OF STRUCTURE	--	[illegible]	[illegible]	
CONSTRUCTION COSTS				
[illegible]	--	[illegible]	[illegible]	
[illegible]		[illegible]	[illegible]	

SCS 347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Sh. 3 NH 677-H

✓ BJC 3/4

SUB-D BOGER RIVER WATERSHED

STORAGE DATA SCALE 1 IN = 200 FT

ELEV	AREA IN²	AREA FT²	AREA ACRES	AREA IN²	AREA FT²	AVG AREA ACRES	TOTAL AREA IN²	TOTAL AREA FT²	TOTAL AREA ACRES	Σ TOTAL AREA ACRES	AVG AREA ACRES	DIFF IN ELEV FT	INCREMENT OF STORAGE AC-FT	TOTAL STORAGE AC-FT	STAGE FT		
2[illegible]	[illegible] ELEVATION = [illegible] OF						[illegible]	[illegible]	0								
										3.37		3.0					
[illegible]	[illegible]	147,000	3.37	—	—	—	3.470	151,000	3.47					[illegible]	[illegible]		
										11.12	5.620	4.0	22.24				
[illegible]	5,130	324,800	7.46	0.300	13,000	0.28	8,920	388,800	7.73					44.96	6		
										20.26	10.130	4.0	40.52				
[illegible]	[illegible]	441,400	10.13	[illegible]	116,800	2.68	13,605	592,600	13.63					[illegible]	[illegible]		
										28.93	14.465	4.0	57.86				
233	11,735	511,400	10.96	5,190	237,000	5.44	17,825	776,600	16.40					103.72	12		
										31.74	15.870		75.48				
234	12,000	522,600	11.88	5,235	241,800	9.45	23,235	1,012,400	21.34					178.91	18		
										50.34	25.170	4.0	100.68				
[illegible]	9,747	424,650	19.17	12,235	532,900	15.63	31,582	1,376,250	29.60					279.47	22		
										63.60	31.80	4.0	127.20				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	864,600	20.36	[illegible]	[illegible]	[illegible]					406.69	26		
										73.32	36.66	4.0	146.64				
237	16,627	724,350	16.63	8,235	358,900	23.47	40,161	1,684,650	38.72					519.33	30		
										81.67	40.835	4.0	163.34				
[illegible]	17,115	745,600	16.27	[illegible]	410,800	26.65	40,983	1,877,400	43.15					733.03	34		
										89.62	44.81	4.0	179.24				
[illegible]	[illegible]	774,000	17.78	[illegible]	1,283,400	29.44	[illegible]	2,654,400	46.97					1110.51	38		
										96.29	48.145	4.0	192.58				
[illegible]	[illegible]	771,200	17.70	34,955	1,349,400	33.12	54,265	2,340,600	49.62					1108.59	42		
										102.73	51.365	4.0	205.46				
[illegible]	20,933	813,500	18.67	31,291	1,197,600	34.34	61,003	2,304,200	52.91					1314.35	46		
										109.76	54.88	4.0	219.52				
[illegible]	21,412	855,240	19.70	[illegible]	1,278,400	37.15	67,976	2,912,640	56.65					1533.87	50		
										117.31	58.655	4.0	234.62				
250	22,000	900,000	20.66	43,455	1,729,400	39.70	63,735	2,629,400	60.36					1768.21	54		

GPO 883936

SCS 347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Sh. 4 NH 677-A

---LITE 2 AREA ZUCK WATERSHED

---STAGE STORAGE DATA - SCALE 1" = 200 FT

[illegible]	AREA IN²	AREA FT²	AREA ACRES	AREA IN²	AREA FT²	AREA ACRES	TOTAL AREA IN²	TOTAL AREA FT²	TOTAL AREA ACRES	& TOTAL AREA ACRES	SURF AREA ACRES	DIFF IN ELEV. FT	INCREMENT OF STORAGE AC-FT	TOTAL STORAGE AC-FT	STAGE FT		
360	20.500	700,000	30.66	43.935	1,224,400	37.70	64.735	2,624,400	60.36					1768.29	54		
										133.73	61.565	4	245.46				
364	23.425	825,600	21.50	45.000	1,804,000	41.84	68.425	2,629,600	63.34					2013.75	58		
										129.79	64.895	4	259.58				
368	24.000	855,600	22.63	41.670	1,701,600	43.79	70.33	2693,200	66.42					2272.33	62		
										136.09	68.045	4	272.18				
372**	25.755	1,095,000	28.63	49.520	1,996,500	45.84	75.275	3,035,100	27.67					2544.51	66		
	1.053	1,601,300	36.77														
** 370	E. DIC	1002															
* V. CVEN																	
** REVIL MEASURED TO E OF DAM																	

GPO 861936

SCS-319
6-58

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Emergency Spillway

HYDROGRAPH COMPUTATION

NM 077

Sh. 7

WATERSHED OR PROJECT [illegible] STATE [illegible]

STRUCTURE SITE OR SUBAREA [illegible]

DR. AREA 2.64 SQ. MI. T_c 4.30 HR. RUNOFF CONDITION NO. II

RUNOFF CURVE NO. 77 . STORM DISTRIB. CURVE II . HYDROGRAPH FAMILY NO. 484

STORM DURATION 6 HR. RAINFALL: POINT 7.20 IN. AREAL 7.74 IN.

Q 3.71 IN. COMPUTED T_p 5.01 HR. T_o 4.55 HR.

$(T_o \div T_p)$: COMPUTED 1.50 : USED 1.50 . REVISED T_p 5.01 .

$q_p = \frac{484\ A}{REV.\ T_p}$ = 1067 CFS. Qq_p = 4176 CFS.

t(COLUMN) = (t/T_p) REV. T_p. q(COLUMN) = (q_c/q_p) Qq_p.

LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS
1	0	0	21	[illegible]	[illegible]	41		
2	[illegible]	[illegible]	22	[illegible]	[illegible]	42		
3	[illegible]	[illegible]	23	[illegible]	[illegible]	43		
4	[illegible]	[illegible]	24	[illegible]	[illegible]	44		
5	[illegible]	[illegible]	25	[illegible]		45		
6	[illegible]	[illegible]	26			46		
7	[illegible]	[illegible]	27	[illegible]		47		
8	[illegible]	[illegible]	28	[illegible]		48		
9	[illegible]	[illegible]	29	[illegible]	[illegible]	49		
10	[illegible]	[illegible]	30			50		
11	[illegible]	[illegible]	31	[illegible]	[illegible]	51		
12	[illegible]	[illegible]	32	[illegible]		52		
13	[illegible]	[illegible]	33	[illegible]	[illegible]	53		
14	[illegible]	[illegible]	34			54		
15	[illegible]	[illegible]	35			55		
16	[illegible]	[illegible]	36			56		
17	[illegible]	[illegible]	37			57		
18	[illegible]	[illegible]	38			58		
19	[illegible]		39			59		
20	[illegible]	[illegible]	40			60		

SCS 319
6-58

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NH 677

HYDROGRAPH COMPUTATION

WATERSHED OR PROJECT _____ STATE _____

STRUCTURE SITE OR SUBAREA _____

DR. AREA _____ SQ. MI. T_c _____ HR. RUNOFF CONDITION NO. _____

RUNOFF CURVE NO. _____ STORM DISTRIB. CURVE _____ HYDROGRAPH FAMILY NO. _____

STORM DURATION _____ HR. RAINFALL: POINT _____ IN. AREAL _____ IN.

Q _____ IN. COMPUTED T_p _____ HR. T_o _____ HR.

$(T_o \div T_p)$: COMPUTED _____ : USED _____ REVISED T_p _____

$q_p = \frac{484\ A}{REV.\ T_p}$ = _____ CFS. Qq_p = _____ CFS.

t(COLUMN) = (t/T_p) REV. T_p. q(COLUMN) = (q_c/q_p) Qq_p

LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS
1	0	0	21	15.12	551.71	41		
2	0.76		22	15.88	451.23	42		
3	1.52		23	16.64	320.62	43		
4	2.28		24	17.40	210.48	44		
5	3.04		25	18.16	140.27	45		
6	3.80		26	18.92	90.21	46		
7	4.56	7,553.73	27		70.10	47		
8	5.32	7991.1	28		50.07	48		
9	6.08	75	29	21.20	0	49		
10		6413.55	30			50		
11	7.61		31			51		
12	8.37	4115	32			52		
13	9.13		33			53		
14			34			54		
15	10.65		35			55		
16		2022	36			56		
17	12.17		37			57		
18			38			58		
19			39			59		
20			40			60		

SCS 347 9-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Sh 11

[illegible] - BASE RIVER WATERSHED - EXTENDED RAINFALL & RUNOFF DATA

[illegible] RUNOFF CURVES

UH 677-H

TIME		100 YEAR RAINFALL P	RUNOFF Q (47)	10 YR RAINFALL P	AMC II RUNOFF Q_p (47)	+ SNOWMELT SNOW MELT Q_s	TOTAL RUNOFF ΣQ	10 YR RAINFALL P	AMC III RUNOFF Q (52)
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.04	.11	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.08	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1.00	[illegible]	[illegible]	4.15	1.64	1.0	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	14.1	[illegible]	[illegible]	[illegible]	[illegible]	13.31	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	11.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	12.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11.35	[illegible]

COMPUTATION SHEET
SCS-522 REV 5-58

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

STATE N H PROJECT SITE 2 SUGAR RIVER WATERSHED

BY [illegible] DATE 7-8-64 CHECKED BY [illegible] DATE 11-4 JOB NO N/H 577-H

SUBJECT HIGH STAGE ORIFICE SHEET 14 OF

REQ'D SEDIMENT STORAGE 62 AC-FT

" RETENTION STORAGE 441 AC-FT

REQ'D FLOOD STORAGE -

(LOW STAGE TO EMERGENCY SPILLWAY) 1335 AC-FT

TOTAL STORAGE REQ'D 1838 AC-FT

FROM STAGE STORAGE CURVE 1855 AC-FT - ELEV. 901.5

ELEV - CREST OF HIGH STAGE ORIFICE ELEV. 896.0

DIFF IN ELEV. 5.5 FT

HIGH STAGE ORIFICE (SEE SCS SD DATED 5/1-, 58)

FOR D = 48"

USE 2 - 2.0' X 12.0' OPENINGS

$A = 2 \times 2.0 \times 12.0 = 48\ FT^2$

$L = 2 \times 12.0 = 24\ FT.$

WEIR FLOW - $Q = 3.1(L)H^{3/2}$

$Q = 3.1 \times 24 \times H^{3/2}$

$Q = 74.4\ H^{3/2}$

ORIFICE FLOW $Q = .6AV\sqrt{2gh}$

$Q = 0.67(48.0)(8.03)\ h^{1/2}$

$Q = 258\ 24\ H^{1/2}$

PIPE FLOW

EMERG SPILLWAY CREST ELEV. 901.5

PIPE OUTLET ELEV. 896.0

DIFF 5.5

$H = 53.5 - 2.0 = 53.5$

COMPUTATION SHEET
SCS-522 REV 8-58

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

STATE NM PROJECT SITE 2 CIMARRON
BY ANK DATE 2-10-65 CHECKED BY DATE
SUBJECT REVISED PRINCIPAL SPILLWAY PIPE FLOW CAPACITY SHEET OF

$Q = C_p H^{1/2}$

(FALL CAPACITY)

$$C_p = \sqrt{\frac{29\, n^2 L}{1.4 K_e + K_p L_p + K_c \left(\frac{n L_p}{1.0 R}\right)^2}}$$

1.0 (Refer to TR. 49)

$$C_p = \sqrt{\frac{64.32 \times 42.57}{1.0 + 1.00 - 0.6042 - 0.1024 \left(\frac{3.5}{48.0}\right)^2 \left(\frac{42.32}{23.3}\right)}}$$

$$C_p = \sqrt{\frac{13,172.5}{1.0 + 1.00 - 2.08 + 0.058}}$$

$$C_p = \sqrt{\frac{13,172.5}{2.978}}$$

$$C_p = \sqrt{3,401.12}$$

$$C_p = 58.32$$

$$Q = C_p H^{1/2}$$

$$Q = 58.32 \left(961.50 - 934.75\right)^{1/2} = 58.32 \left(26.7\right)^{1/2}$$

$$Q = 58.32 \left(7.53\right) = 439.1 \text{ CFS}$$

$$* Q_n = \frac{2 g A^2}{\left(2.0 + K_e + \ldots\right)}$$

SCS 344 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SITE #2 [illegible]

REVISED [illegible]

Elev. H_2O	Adj. Outlet Elev	H	H½	Q = CB.2H	Elev H_2O	H	H	Q = CB.2H
858.0	854.8	3.2	6.14	43.7	856.5	1.7	7.1	33.5
858.2		3.4	6.15	44.9	856.8	2.0	7.1	37.1
58.4		3.6	6.17	46.5	857.0	2.2	7.1	40.8
58.6		3.8	6.17	47.7	857.2	2.4	7.1	44.6
58.8		4.0	7.00	48.2	857.5	2.7	7.1	50.2
59.0		4.2	7.01	49.8	857.8	3.0	7.1	55.8
59.2		4.4	7.05	51.2	858.0	3.2	7.1	59.5
59.5		4.7	7.07	53.2	858.2	3.4	7.1	63.2
59.7		4.9	7.12	54.8	858.5	3.7	7.1	68.7
59.9		5.1	7.14	56.0	858.8	4.0	7.1	74.3
60.2		5.4	7.19	58.0	859.0	4.2	7.1	78.0
60.4		5.6	7.21	59.2	859.2	4.4	7.1	81.7
60.6		5.8	7.23	60.7	859.5	4.7	7.1	87.2
60.8		6.0	7.26	62.3				
61.0		6.2	7.29	63.8				
61.2		6.4	7.33	65.3				
61.4		6.6	7.36	66.8				
61.6		6.8	7.40	68.3				
61.8		7.0	7.43	69.8				
62.0		7.2	7.46	71.3				
62.2		7.4	7.50	72.8				
62.4		7.6	7.53	74.3				
62.6		7.8	7.56	75.8				
62.8		8.0	7.60	77.3				
63.0		8.2	7.63	78.8				
63.2		8.4	7.66	80.3				
63.4		8.6	7.69	81.8				
63.6		8.8	7.73	83.3				
63.8		9.0	7.76	84.8				

[illegible]

GPO 842933

SCS 347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

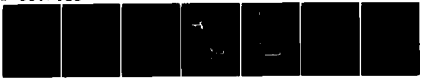
SH. 18

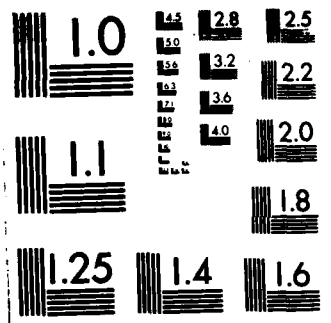
	STATION	HIGH STAGE $Q = 24.40 H^{3/2}$			HIGH STAGE $Q = 228.4 H^{1/2}$													
	FT	H	$H^{3/2}$	Q	H	$H^{1/2}$	Q	H										
	18.00	0	0	0														
	18.20	0.20	.09	6.30														
	18.40	0.40	.25	18.60														
	18.60	0.60	.46	34.04														
	18.80	0.80	.72	53.56														
	19.0	1.00	1.00	74.40	0	0	0	45.00	6.71	336.38								
	19.20	1.20	1.31	97.46	0.2	0.46	116.19	45.20	6.67	306.68								
	19.40	1.40	1.66	123.50	0.4	0.63	160.67	45.40	6.74	370.93								
	19.60	1.60	2.02	150.29	0.6	0.77	195.51	45.60	6.75	370.58								
	19.80	1.80	2.42	180.05	0.8	0.89	226.80	45.80	6.77	371.67								
	20.00	2.00	2.83	210.55	1.0	1.00	254.20	46.00	6.76	371.22								
	20.25	2.25	3.38	251.88	1.25	1.12	285.00	46.50	6.82	374.62								
	21.00	3.00	5.20	386.88	2.0	1.41	364.06	47.00	6.86	376.91								
	21.50	3.50	6.55	487.32	2.5	1.58	402.96	47.50	6.89	378.24								
	22.0				3.0	1.73	440.69	48.00	6.93	380.66								
	22.50				3.5	1.87	482.83	48.50	6.96	382.40								
	23.00				4.0	2.0	510.40	49.00	7.00	384.30								
	23.50							49.50	7.04	386.50								
	24.00							50.00	7.07	388.24								
	24.50							50.50	7.11	390.80								
	25.0							51.00	7.14	392.33								
	25.50							51.50	7.18	394.68								
	26.0							52.00	7.21	396.55								
	26.5							52.50	7.25	398.50								
	27.00							53.00	7.28	400.27								
	27.50							53.50	7.32	402.50								

HIGH STAGE OVERFLOW
LOW STAGE ORIFICE
PIPE FLOW

AD-A156 378 NATIONAL PROGRAMS FOR INSPECTION OF NON-FEDERAL DAMS BAKER FLOODWATER RES..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV JUN 79 1/2

UNCLASSIFIED FIG 13/13 NL





SCS-344 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Sh. 20 ANL 6-25-65

SITE 2 BAKER RIVER WATERSHED ✓ 12/9/65

EMERGENCY SPILLWAY COMPUTATIONS

b = 80', L = 160', n = 0.04, Z = 2.5

Note HNTB/Ky Emer Spillway Changed to 95' width NH-677-H

$\frac{q}{Q}$ / W	d_c FROM ES 124 18 OF 52	$\frac{V^2}{2g}$ FROM ES 139	H_p $(\frac{V^2}{2g}+d_c)$	Q EMERGENCY SPILLWAY	Sc ES-98 3 OF 4	Vc ES-98 1 OF 4	ELEV OF WATER SURFACE 861.5 + H_p	
0	—	—	—	—	—	—	861.50	
1	0.90	—	0.90	~~80~~	0.0345	3.18	862.40	
2	1.21	—	1.21	168	0.0296	4.00	862.71	
3	1.50	0.06	1.56	~~240~~	0.0270	4.58	863.06	
4	1.73	0.08	1.81	320	0.0255	5.05	863.31	
5	1.92	0.10	2.02	400	0.0242	5.45	863.52	
6	2.09	0.12	2.21	480	0.0232	5.78	863.71	
8	2.42	0.16	2.58	640	0.0218	6.36	864.08	
10	2.71	0.19	2.90	800	0.0208	6.85	864.40	
15	3.32	0.28	3.60	1200	0.0189	7.83	865.10	
20	3.83	0.36	4.19	1600	0.0177	8.65	865.69	
25	4.30	0.45	4.75	2000	0.0168	9.30	866.25	
30	4.73	0.52	5.25	2400	0.0162	9.90	866.75	
35	5.12	0.60	5.72	2800	0.0156	10.40	867.22	
40	5.54	0.66	6.20	3200	0.0152	10.85	867.70	
50	6.23	0.79	7.02	4000	0.0144	11.70	868.52	
60	6.88	0.91	7.79	4800	0.0138	12.40	869.29	
70	7.42	1.04	8.46	5600	0.0133	13.15	869.96	
80	7.96	1.18	9.14	6400	0.0129	13.75	870.64	
90	8.47	1.27	9.74	7200	0.0126	14.25	871.24	
100	8.97	1.39	10.36	~~8000~~ 7250	0.0123	14.75	871.86	
							872.27	

U. S. GOVERNMENT PRINTING OFFICE: 1959 O - 507061

SCS-344 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Sh. 22 #

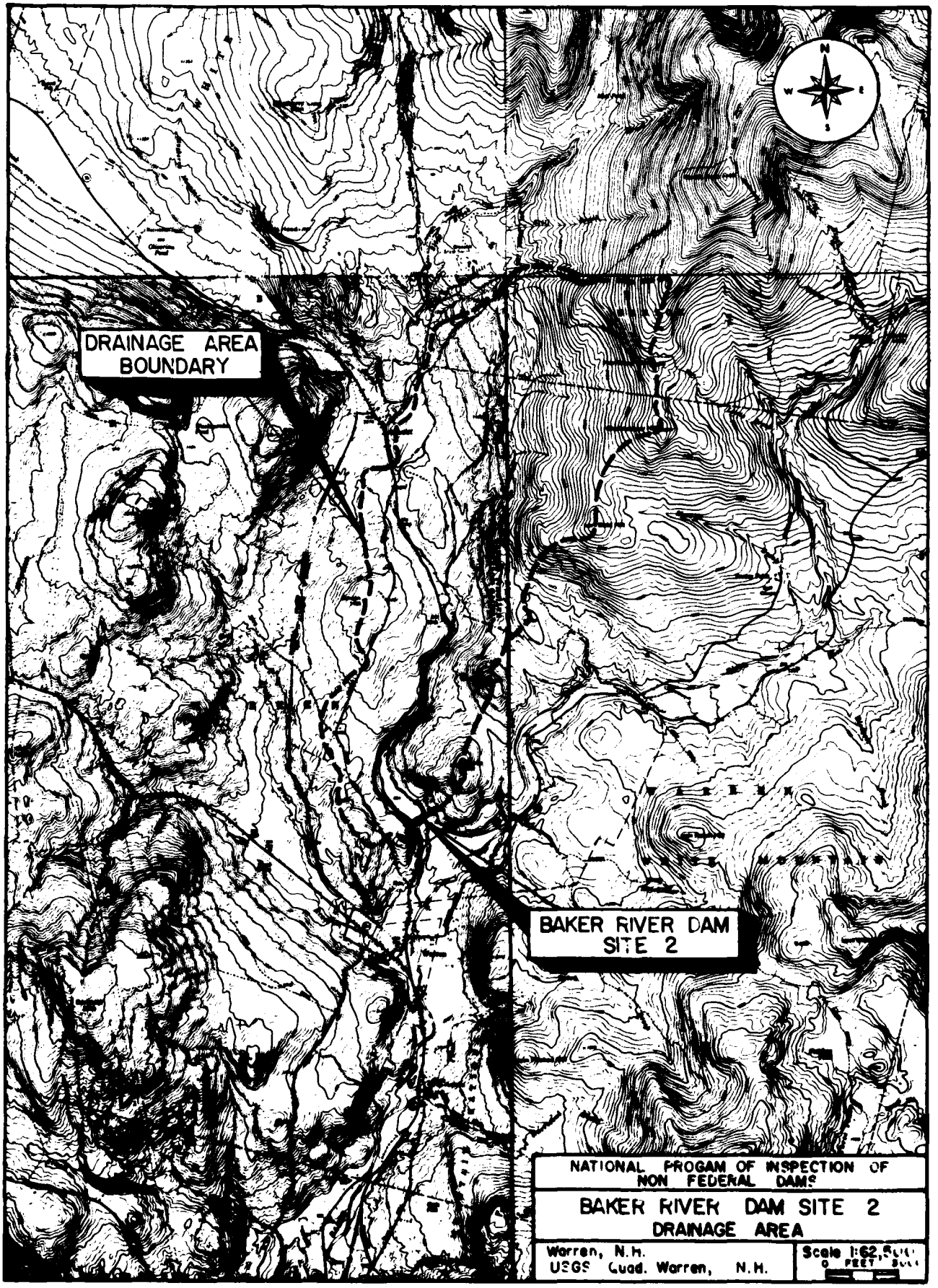
SITE #2 BAKER COVER WATERSHED

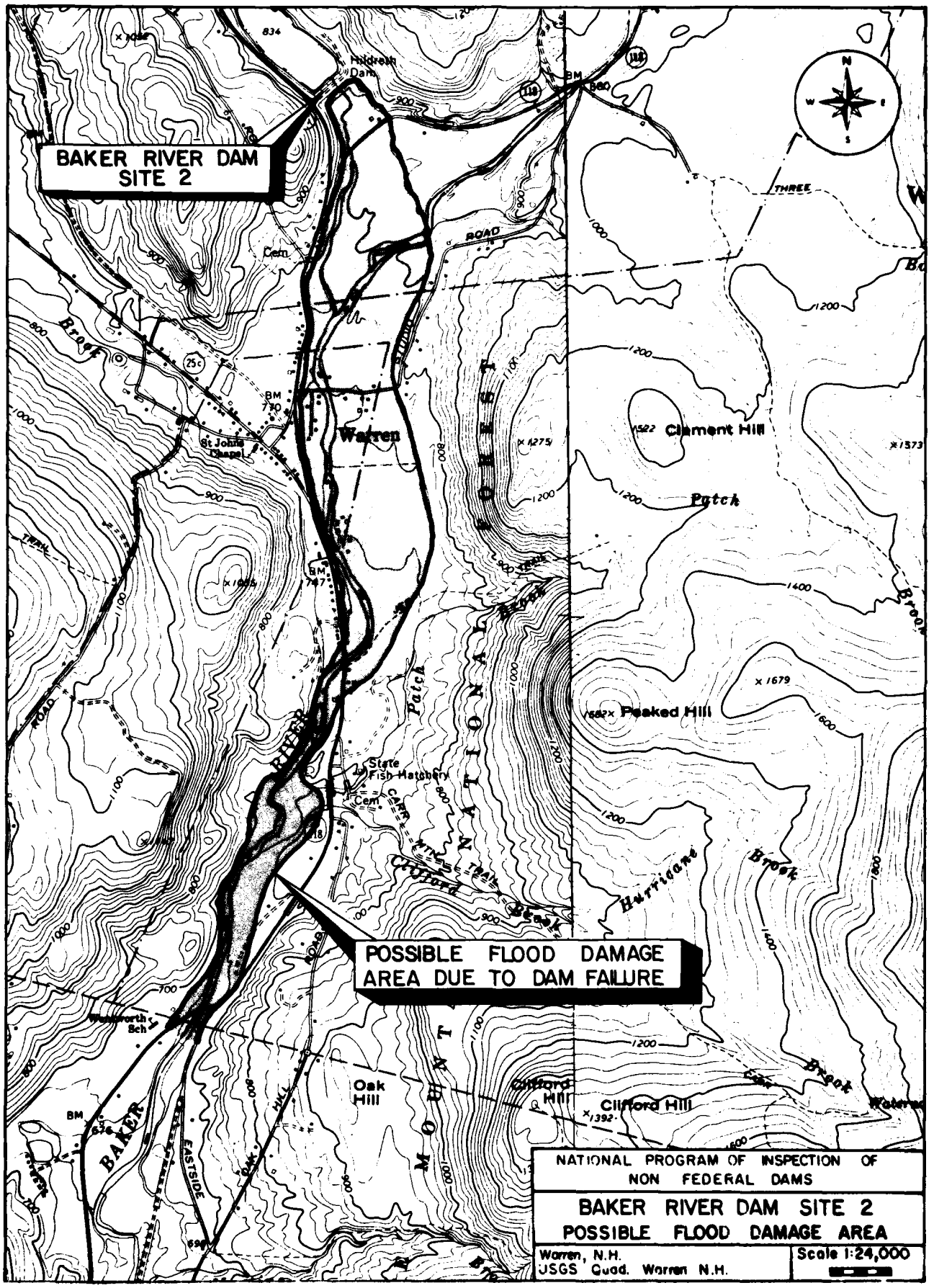
PRINCIPAL SPILLWAY & EMERGENCY SPILLWAY FLOWS

Note by HNTB/RY Computations for 80' wide spillway

① Elev	② Pipe Flow (cfs)	③ Emerg. Spwy Flow (cfs)	②&③ (cfs)					
Emerg. Spwy. Crest → 861.5	439	0	439					
862.0	441	30	471					
62.5	443	110	553					
63.0	445	235	680					
63.5	447	400	847					
64.0	449	615	1064					
64.5	451	850	1301					
65.0	453	1140	1593					
65.5	454	1465	1919					
66.0	456	1815	2271					
66.5	458	2200	2658					
67.0	460	2605	3065					
67.5	462	3030	3492					
68.0	464	3485	3949					
68.5	465	3975	4440					
69.0	467	4485	4952					
69.5	469	5040	5509					
70.0	471	5620	6091					
70.5	473	6245	6718					
71.0	475	6890	7365					

GPO 942933


N
W
E
S
DRAINAGE AREA BOUNDARY
BAKER RIVER DAM SITE 2
NATIONAL PROGAM OF INSPECTION OF NON FEDERAL DAMS
BAKER RIVER DAM SITE 2
DRAINAGE AREA
Warren, N.H.
USGS Quad. Warren, N.H.
Scale 1:62,5
0 FEET


BAKER RIVER DAM
SITE 2
POSSIBLE FLOOD DAMAGE
AREA DUE TO DAM FAILURE
Holdreth Dam
Cem.
ROAD
Warren
St John's Chapel
Brook
Patch
Peaked Hill
Clement Hill
Clifford Hill
Oak Hill
Hurricane
Brook
Clifford
Brook
BAKER
RIVER
EASTSIDE
ROAD
MOUNTAIN
NATIONAL PROGRAM OF INSPECTION OF
NON FEDERAL DAMS
BAKER RIVER DAM SITE 2
POSSIBLE FLOOD DAMAGE AREA
Warren, N.H.
USGS Quad. Warren N.H.
Scale 1:24,000

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(4) STATE	(5) COUNTY	(6) CONGR DIST.	(7) STATE	(8) COUNTY	(9) CONGR DIST.	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
NH	231	NED	NH	009	02				BAKER FLOODWATER RESERVOIR SITE 2	4356.4	7153.4	18JUN79

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
DAVID WAYNE HILDRETH DAM	BAKER FLOODWATER RESERVOIR SITE 2

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	05	BERRY BROOK	WARREN	1	539

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES MAXIMUM (ACRE FT.)	(27) NORMAL (ACRE FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
PGHE	1969	CR	84	68	2400	500	N	N	N		B	18JUN79

(28) REMARKS

(29) U/S HAS	(30) SPILLWAY CREST LENGTH	(31) SPILLWAY TYPE	(32) SPILLWAY WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) POWER CAPACITY PROPOSED (MW)	(37) NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
1	805	U	95	6706	292983											

(38) OWNER	(39) ENGINEERING BY	(40) CONSTRUCTION BY
N H WATER RESOURCES BD	SOIL CONSERVATION SER	WINDHAM ROADS

(41) REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

(42) INSPECTION BY	(43) INSPECTION DATE DAY | MO | YR	(44) AUTHORITY FOR INSPECTION
HOWARD NEEDLES TAMMEN BERGENDOFF	17MAY79	PUBLIC LAW 92-367 8AUG1972

(45) REMARKS